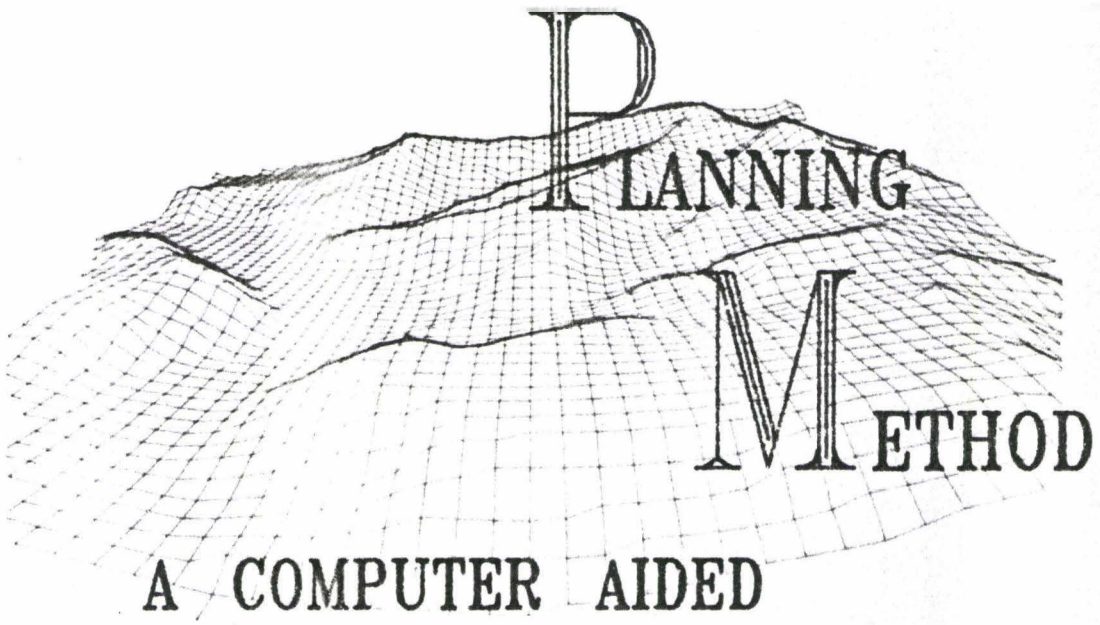
WILLAMETTE VIEWSHED PLANNING METHOD



A COMPUTER AIDED VIEWSHED PLANNING PROCESS FOR THE WILLAMETTE NATIONAL FOREST

A COMPUTER AIDED VIEWSHED CORRIDOR PLANNING PROCESS

FOR THE WILLAMETTE NATIONAL FOREST

WILLAMETTE VIEWSHED CORRIDOR

LOWELL RANGER DISTRICT

WILLAMETTE NATIONAL FOREST

PACIFIC NORTHWEST REGION

USDA FOREST SERVICE

PREPARED BY
FRANK L. HUNSAKER
LANDSCAPE ARCHITECT
WILLAMETTE NATIONAL FOREST
P.O. BOX 10607
EUGENE, OREGON 97440

CLEMSON CLASS OF 1985
JUNE 1986

ABSTRACT

Author: Frank L. Hunsaker
Landscape Architect
Willamette National Forest
P.O. Box 10607
Eugene, Oregon 97440
C (503) 687-6830 - FTS 425-6830

Title: A Computer Aided Viewshed Corridor Planning Process for The Willamette National forest

Abstract: The Willamette National Forest has identified ten primary travel routes on the forest as "Viewshed Corridors". There is a need to manage and monitor both the qualitative and quantitative aspects of each viewshed in accordance with the Land Management Plan. This project is directed to the quantitative aspect and describes a process which utilizes the computers available on the forest to: 1-retrieve TRI (total resource inventory) data stored at Ft. Collins, Colorado; 2-identify the quantities of timber by size classes, VAC (visual absorption capability) and land use allocations; 3-map the information using CAD (computer aided drafting); 4-depict information in perspective views using the Perspective Plot computer program. This process provides a method which can be used to project quantities and percents of acres of tree sizes into the future for timber sale planning. The resulting information can be used to make decisions of where and how much timber can be harvested, maintaining a balance and distribution of timber size classes through the tree growth cycle.

The quantitative information derived from this process can be used to assist in maintaining the qualitative aspects of viewshed planning as described in most viewshed planning processes.

EXECUTIVE SUMMARY

Title: A COMPUTER AIDED VIEWSHED CORRIDOR PLANNING PROCESS FOR THE WILLAMETTE VIEWSHED CORRIDOR

Author
Frank L. Hunsaker
Landscape Architect
Willamette National Forest
P.O.Box 10607
Eugene, Oregon 97440
(503) 687-6830 FTS 425-6830

Summary

This project is intended to: (1) Utilize the present state of the art of viewshed planning. (2) Identify the necessary steps to follow. (3) Utilize resource data in planning timber sales. (4) Use computer technology to perform viewshed planning. (5) Utilize that data in timber sale selection and planning within viewshed corridors on the Willamette National Forest.

The following steps were taken to obtain information and develop the project: (1) Literature searches were performed. (2) All information in this office was gathered. (3) Information obtained from the above searches was reviewed and notes taken to organize it into useable data. (4) Computer programers were notified of the intent of this project to see if what was trying to be done was possible. (5) During the process of developing the project, additional uses of the computer emerged. The additional uses have all been incorporated in the project.

Pursuing this project has resulted in an automated process to complete the quantitative portion of viewshed planning. Being able to display the resultant information on maps and perspective plots is another benefit of the project. It is estimated that with the automated system considerable time will be saved in the viewshed plan planning process. By using the computer programs and processes contained herein, viewshed data will be easily updated and projected to assess the harvest condition at any future date for five year timber program planning.

Because of the nature of the forthcoming Land Use Plan it will be necessary to have a method to measure the quantitative aspect of timber sale status and planning. The process described in this project will allow that to be accomplished easily and in as much detail as needed. It is recommended that the Forest adopt this process for all ten of the viewsheds. It is also recommended that other forests in the region review this process for use on their forest.

ACKNOWLEDGEMENTS

Many people have been involved in the formation and execution of this project. The following people have been instrumental in making this project a reality.

The need for a basis for identifying and measuring the quantitative aspect of viewshed planning began after the Willamette National Forest Land Use Plan was completed in 1977. Robert Longcore, Forest Planner, recognized the need and prepared the first Viewshed Plan on the forest.

The process Robert began, was worked on, being revised bit by bit, by many Students from the University of Oregon who worked in this office part time during the past six years.

A great deal of credit goes to Karen Engelhardt of this office for her interest in this project. She provided the idea to use computers to process data from TRI (total resource inventory). Karen was also helpful by assisting in the formulation of information needed by the computer programmers.

District personnel from the Lowell Ranger District were very helpful in providing a sample project area. They also filled in missing information in the TRI data base.

Debbie Bushnell the forest TRI coordinator spent a great deal of time and effort to obtain the exact information in the exact format from Ft Collins.

The forest computer programmer, Nora Holmquist, was instrumental in writing a program to establish VAC and arrange the computer data for use in the PRESENT program.

Steve Brenner provided the necessary information to transfer files from the Data General Computer to the Hewlett Packard Computer. He has also helped me understand the mechanics of the HP and CAD.

Much help was needed to get up to date in the CAD program. Paul Howard came to my rescue and provided a great deal of assistance in many ways.

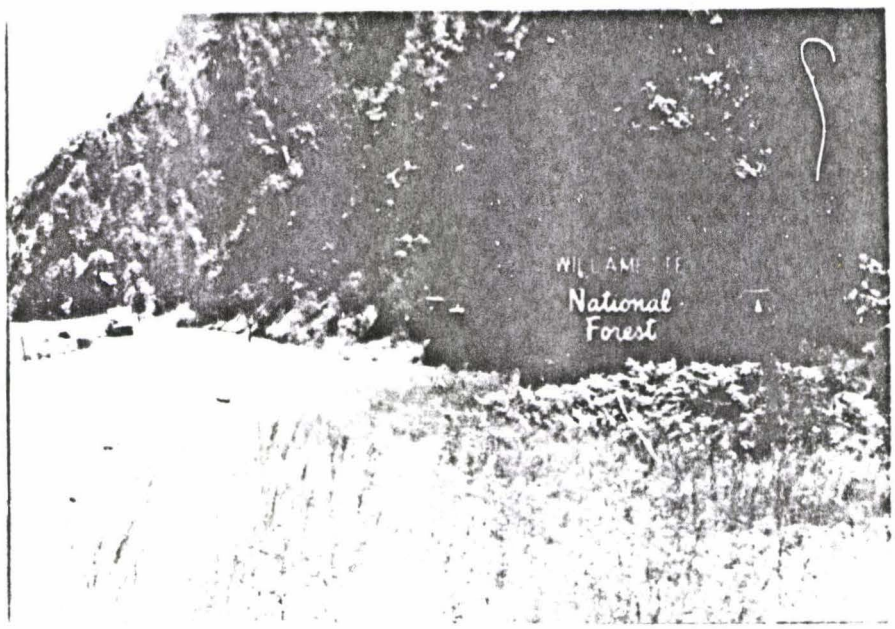
Through Paul's efforts the assistance of Andy Scheible of the Olympic National Forest was secured. Andy updated the CAD program so it would accomplish the task we desired of it in the way we wanted to do it.

Much thanks go to those in the word processing section of this office for their efforts and assistance in proof reading and correcting this document.

Needed encouragement was received from Dennis Dudley, the assistant forest landscape architect. His encouragement spurred me on and gave me confidence in the process being pursued.

The support and freedom given me by my supervisor Dick Grace to accomplish this project on the job because of the need for computers is appreciated.

Last, but not least, I appreciate the support I received from my wife Diane and my family. It's always good to talk to someone who will hear you out and provide understanding and advice when appropriate.



W V P M

Willamette
Viewshed Planning Method

TABLE OF CONTENTS

LIST OF PHOTOS AND MAPS

I. INTRODUCTION 1

A. PURPOSE OF THIS PAPER 4
1. FLOW CHART 5

B. LITERATURE REVIEW 6

II. FORWARD 8

A. PROJECT SITE LOCATION 11

B. WILLAMETTE VIEWSHED GOAL 11

C. BACKGROUND 12

III. INVENTORY AND ANALYSIS 15

A. DESCRIPTION OF THE VIEWSHED CHARACTERISTIC LANDSCAPE 17

B. TIMBER STAND FACTORS 20

C. SEQUENCE OF EXISTING VISUAL EXPERIENCES 21

D. SEQUENCE OF DESIRED VISUAL EXPERIENCES 28

E. NEED FOR QUANTITATIVE AND QUALITATIVE STANDARDS IN VIEWSHED MANAGEMENT 29

F. SUB DRAINAGES 30

IV. "TRI" DATA IN FORT COLLINS COMPUTER BANK 31

A. STRUCTURE OF DATA IN TRI 33

B. SUB DRAINAGE BOUNDARIES / VIEWSHED BOUNDARIES AND ZIDENT CODES 33

C. ACCESSING AND RETRIEVING TRI INFORMATION 35

V. COMPUTER PROCESSES 36

A. COMPUTER QUERIES AND PROGRAMS USED TO RETRIEVE TREE SIZE CLASSES FROM FT. COLLINS COMPUTER CENTER, AND PROCESS THAT DATA 38

1. TREE SIZE / LAND USE ALLOCATION / SUBDRAINAGE INFORMATION 38

2. UPDATING "TRI" INFORMATION 38

3. FLOW CHART 40

4. RETREIVING UPDATED INFORMATION FROM FT COLLIN IN DESIRED FORMAT 41

5. PROCESSING "TRI" DATA ON THE DATA GENERAL 41

6. USING THE "PRESENT" PROGRAM 42

7. VAC (VISUAL ABSORPTION CAPABILITY) 42

8. VIEWSHED MANAGEMENT DOCUMENTATION 44

B. TIMBER STAND TREATMENT STATUS 47

C. CAD 48

D. HP_DG CONNECTION 49

E. SAMPLE OF "PRESENT" PRINTOUTS, "CAD" DRAWINGS AND "PERSPECTIVE PLOTS" 52

VI. FUTURE NEEDS 78

VII. CONCLUSION 81

VIII. APPENDIX 84

IX. BIBLIOGRAPHY 95

LIST OF PHOTOS AND MAPS

Photo:	Willamette National Forest Entrance Sign	0
Map:	Locater and Vicinity Maps of the Willamette N.F.	3
Chart:	Computer Process Flow Chart	5
Map:	Map of Viewshed, Lowell Dist. Portion & Buckhead	10
Photos:	Log Truck and Views Across Reservoir	13
Photos:	Timbered Slopes, Enclosed Landscape, View South and East	18
Map:	Sequence of Visual Experiences Traveling East	22
Map:	Sequence of Visual Experiences Traveling West	23
Photos:	Rock Outcrops and Natural Openings Larger Vegetation	25
Photos:	Middle Fork Willamette in Buckhead Vicinity	26
Photos:	Detail Landscape Features	27
Chart:	Computer Process Flow Chart	40
Maps:	Produced by "CAD"	52-65

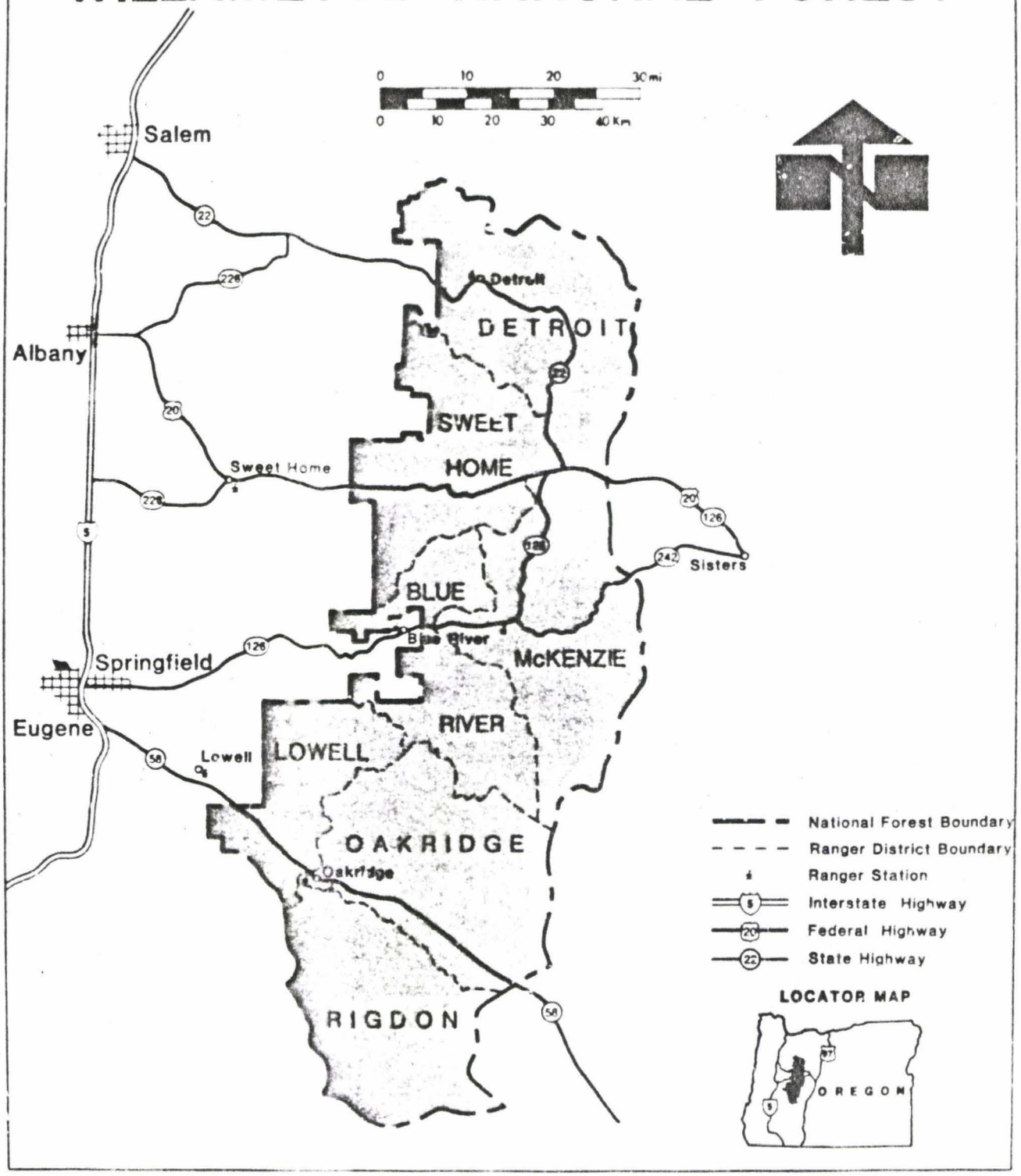
I. INTRODUCTION

I. INTRODUCTION 1

A. PURPOSE OF THIS PAPER 4

1. FLOW CHART 5

B. LITERATURE REVIEW 6


WILLAMETTE NATIONAL FOREST
0 10 20 30 mi
0 10 20 30 40 Km
Salem
Albany
Springfield
Eugene
Lowell
Sweet Home
In Detroit
DETROIT
SWEET HOME
BLUE
Blue River
McKENZIE RIVER
LOWELL
OAKRIDGE
Oakridge
RIGDON
Sisters
22
226
20
126
5
58
242
National Forest Boundary
Ranger District Boundary
Ranger Station
Interstate Highway
Federal Highway
State Highway
LOCATOR MAP
OREGON
97

PURPOSE OF THIS PAPER

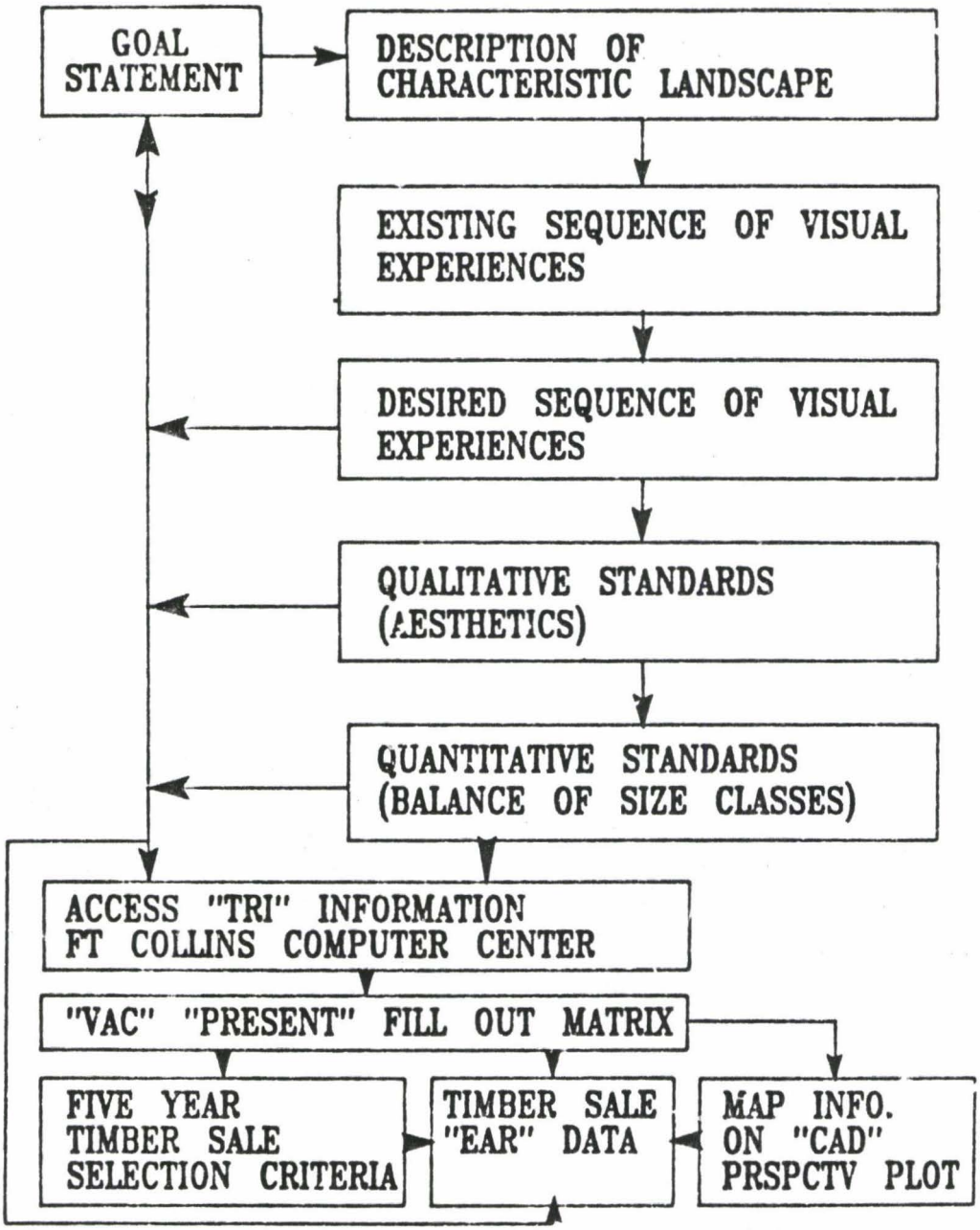
The purpose of this paper is to provide a viewshed planning method that can be used to prepare a viewshed plan on the Willamette National Forest utilizing the process developed from 1978 to the present time. The purpose also includes utilizing the computer to retrieve resource data from Fort Collins Computer Center, and processing and displaying that data in differing formats. This will assist those involved in timber sale planning to balance management activities throughout the viewshed over the full timber grow cycle (rotation).

The ability to, with the aid of a computer, transfer data from one computer system (Data General) to another (Hewlett Packard), and to project and map acres of size classes of timber in the future is also a part of this paper.

To aid in this process, a portion of a viewshed will be used as a sample to display viewshed planning steps and the computer processes mentioned above.

A VIEWSHED CORRIDOR PLANNING PROCESS FOR THE WILLAMETTE NATIONAL FOREST

1986



LITERATURE REVIEW

Literature searches were conducted in the following libraries:

Clemson University Library: No information exists concerning Landscape Management as it relates to scenic or viewshed management.

University Of Oregon Library: One document concerning a landscape inventory for the Sawtooth National Recreation Area exists. This document was written by a planning firm by the name of HOH of Denver, Colorado. Neither the main library nor the Architecture/Landscape Architecture Library has any other literature on the subject or a closely related subject.

WESTFORNET now FS-INFO-NW: There are no directly related publications on the subject of viewsheds, corridors, or scenic management that relate directly to my project subject. Two searches were done in hopes to find something that would apply and be useful for this paper.

The viewshed corridor documents found, written by non-forest service employees are: Hells Canyon National Recreation Area, Visual Resource Inventory & Imnaha Valley Study, by EDAW Inc. of San Francisco; and Willamette Viewshed Corridor, Middle Fork/Salt Creek Reach, prepared for the United States Forest Service, Pacific Northwest Region Six, Willamette National Forest, written by Walker,

Macy and Erickson, Landscape Architects and Planners of Portland, Oregon. Both documents were written under contract for the Forest Service.

A region wide request for Viewshed Corridor Plans was made. Several viewshed plans prepared by Forest Service employees were provided. They are listed in the bibliograpy section.

II. F O R W A R D

II. FORWARD 8

A. PROJECT SITE LOCATION 11

B. WILLAMETTE VIEWSHED GOAL 11

C. BACKGROUND 12

PROJECT SITE LOCATION

The study area for this project is a portion of the Willamette Viewshed along State Highway 58 between the western Forest boundary and the community of Oakridge, Oregon. The subdrainage that will be focused on for the computer aided portion of this document is part of the Willamette Viewshed located on the Lowell Ranger District and is referred to as the Buckhead subdrainage.

WILLAMETTE VIEWSHED GOAL

Provide management direction to retaining and/or create the desired Forest character in an attractive sequential arrangement throughout the duration of the timber growth cycle (rotation); to furnish the necessary supporting size classes and successional stages to maintain that desired character indefinately; to identify opportunities for timber harvest, establish a priority for timber sale areas, provide a basis from which alternatives can be formulated, and achieve the desired visual quality objectives throughout time.

Initiating designs for harvest patterns in the distant foreground and middle ground situations that achieve the above are most critical in this viewshed.

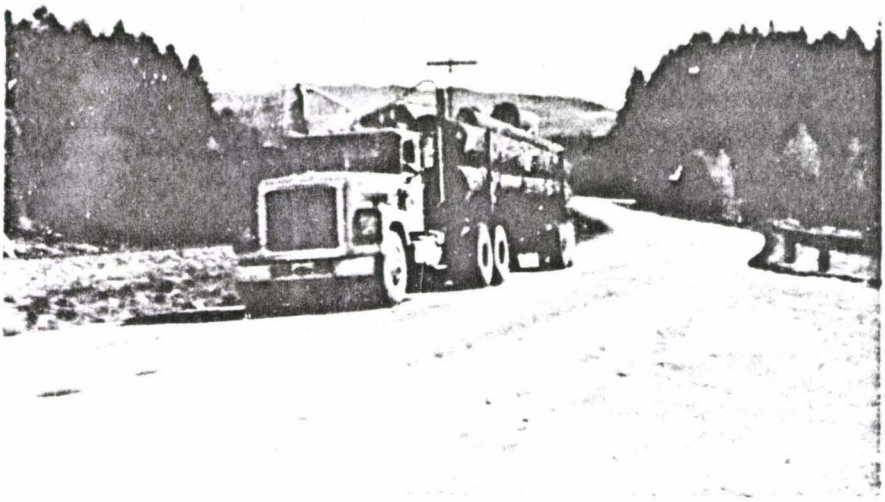
BACKGROUND

Four major state and U.S. highways cross the Willamette National Forest from east to west, linking western Oregon and Washington to central and eastern Oregon, Nevada and points east. Many highway users have as a destination one of the many recreation sites located on National Forest system lands. Recreation opportunities exist year around and consist of camping, sight seeing, picnicking, hiking, horse back riding, fishing, boating, swimming, down hill skiing, cross country skiing, snow play, gathering Forest products, and mountain climbing.

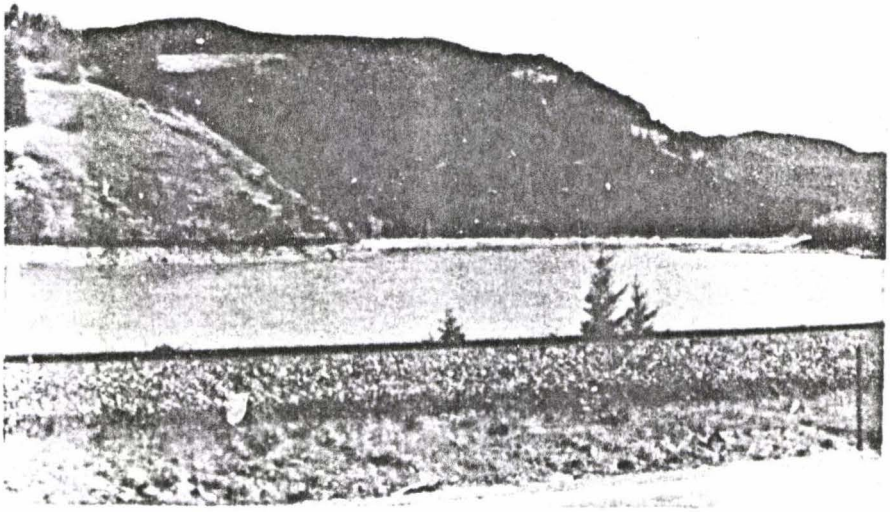
Viewshed Corridors have been designated for the four highways mentioned above and for six Forest highways, making a total of ten selected viewsheds. Boundaries for each viewshed were determined by the use of the VIEWIT computer program, which has mapping capabilities and analyzes the land as seen or potentially seen from any point along a travel route, or in a use area.

The Willamette National Forest boasts the highest annual timber harvest of any National Forest in the Nation. The Forest has historically prepared sales for over 700 MM board feet of timber annually.

Within the ten viewshed corridors are many acres of timber which have not been managed as intensely as the rest of the Forest. These acres of timber are visually sensitive and need to have management direction which allows harvest and at the same time provides guidelines to enhance or preserve the visual integrity of the natural appearing landscape and meet viewshed corridor management objectives.



Logging truck on Hwy 58



View across Lookout Point Reservoir

Looking East

The Forest is located in a transition zone between the heavily forested Northwest Douglas-fir forests and the more diversified forests of southern Oregon and California. This climate provides ample moisture and sunlight for tree growth. New growth on young Douglas-fir trees averages between 36" and 48" annually at low elevations and on good growing sites.

III. INVENTORY AND ANALYSIS

III. INVENTORY AND ANALYSIS 15

A. DESCRIPTION OF THE VIEWSHED CHARACTERISTIC LANDSCAPE 17

B. TIMBER STAND FACTORS 20

C. SEQUENCE OF EXISTING VISUAL EXPERIENCES 21

D. SEQUENCE OF DESIRED VISUAL EXPERIENCES 28

E. NEED FOR QUANTITATIVE AND QUALITATIVE STANDARDS IN VIEWSHED MANAGEMENT 29

F. SUB DRAINAGES 30

DESCRIPTION OF THE VIEWSHED CHARACTERISTIC LANDSCAPE

The Willamette viewshed characteristic landscape is described as it would be observed as one travels from west to east. In general the characteristic landscape is composed of: (1) The basic land form; (2) Vegetation; (3) Rock formations; (4) Water features; and (5) Viewer orientation or position.

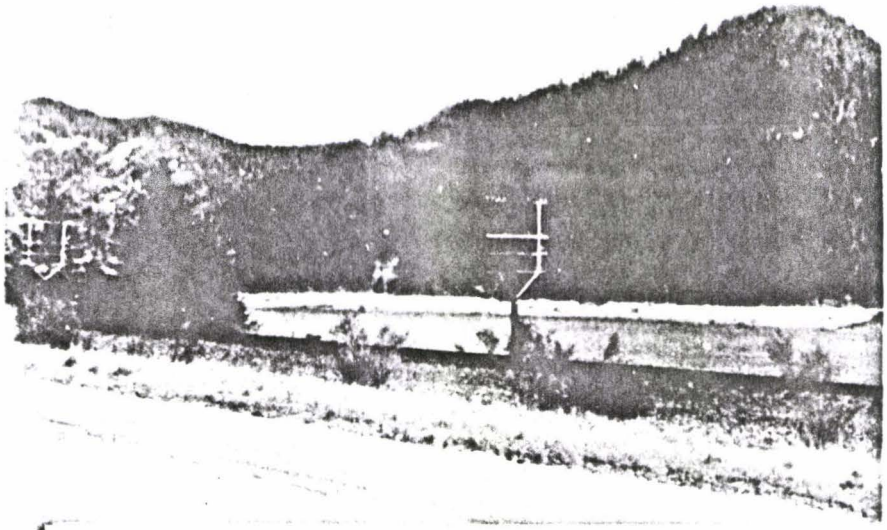
The dominant feature of the western portion of the Willamette viewshed is Lookout Point Reservoir which extends approximately seven miles into the viewshed.

The landform varies from a generally horizontal orientation to a dissected moderately vertical landform orientation.

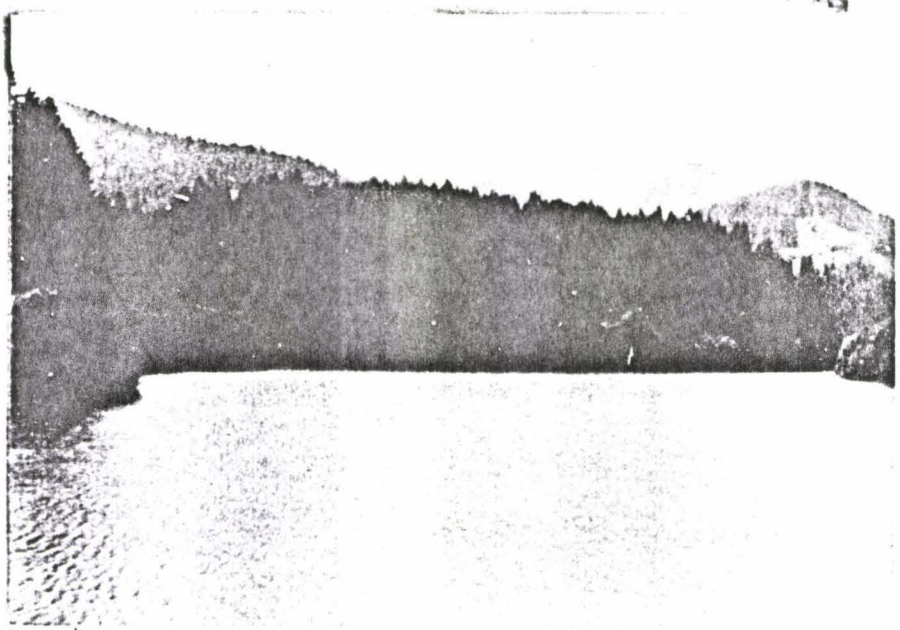
Vegetation is principally coniferous with dry site hardwoods and some riparian zone hardwoods.

The foreground vegetation provides a great deal of variety as it varies from grass and ferns to small shrubs to hardwoods to conifers. Large trees do not dominate the foreground as the smaller trees, grass, and ferns do. Cut banks of rock and soil are an important part of the foreground.

The middle ground distance zone vegetation is comprised of a solid or closed canopy of predominantly coniferous trees. Several natural openings exist in the distant foreground and middleground.



Timbered slopes to north



Enclosed Landscape View south up reservoir arm

Enclosed landscape

Corridor narrows Looking east

Rock outcrops are evident in some of the openings, becoming somewhat dominant at the east end of the reservoir where they form several small horizontal cliffs.

The viewer position is normal and inferior. The character of the viewshed changes as one proceeds east from the horizontal rolling landscape to a constricted landscape in a narrow canyon and then into a small bowl shaped widening of the drainage (The Buckhead Subdrainage). Here the landscape is horizontally oriented and moderately dissected by several vertical ridges and small drainages. The landscape is viewed as foreground and middle ground in this small basin. The floor of the basin is gently sloping to flat with the Willamette River located on the west side, between the road and the valley floor. Vegetative cover consists of conifers (Douglas-fir and cedar) on the north facing slopes with hardwoods (Pacific madrone and vine maple) interspersed with conifers on the south facing slopes. The small valley bottom located in the Buckhead subdrainage has conifers and hardwoods interspersed, with the hardwoods dominating the riparian zone. The presence of large diameter trees over 20" d.b.h. (diameter breast high) is not prevelant in close proximity to the highway, except in this portion of the viewshed.

The opportunity to perpetuate large diameter trees exists in a very few locations, and should be identified and managed for that purpose. The characteristic landscape is viewed from Highway 58 which is located west of the Willamette River. The observer position is inferior to the majority of the landscape viewed. The highway being in close proximity to the river provides the traveler with several brief views of the water. Portions of the river, which are gentle and smooth, are visible as are some rapids and rougher water.

Trees in the foreground screen much of the basin from view from the highway. Intervening vertical ridges screen small inclusions of the landscape.

TIMBER STAND FACTORS

Timber stand information for Region 6 is stored at the Fort Collins Computer Center, and is referred to as TRI (total resource information). These data wereinstalled in the computer in the early 1970s, and has been updated annually.

Information can be retrieved in varying formats. Accessing this information and receiving all of the data desired has been a problem as some data has not been collected and fed into the system. Following is the format developed on this Forest to access the TRI data, update it, and use it to assist in timber sale planning within viewshed boundaries.

SEQUENCE OF EXISTING VISUAL EXPERIENCES

The sequence of existing visual experiences is an inventory of what is observed as a person travels through the corridor. Following is the existing sequence of visual experiences for the Willamette viewshed.

One mile prior to crossing the Forest boundary a spectacular "focal landscape" of Diamond Peak Wilderness, 36 miles in the distance, occurs and remains in view for the duration of that mile.

Rounding the curve at the Forest boundary shifts the observers attention from Diamond Peak to the more immediate surroundings. The observer finds himself in an "enclosed landscape" with the dominant element being Lookout Point Reservoir. The primary view is of the water and the forested hills in the middleground.

Progressing up the road the view is dominated by two clearcuts in the middleground, and several grass covered openings.

Views unfold and then become concealed by vegetation and topography, repeating the sequence two or three times.

Views to the south are limited because of the location of the road cut for the most part into the mountain side. The rock cuts provide "detail" rock and vegetation landscape elements. Occasional views to the south occur where arms of the Reservoir extend to the south of the road, and where the orientation of the road provides views beyond the immediate foreground.

In the vicinity of Hampton Boat Ramp the visual experience begins to change. Vegetative screening occurs more often and hides the panoramic views. The views are of shorter duration. The Highway has been alongside the mainline of the Pacific Coast Railroad up to this point. At Hampton the railroad crosses the Reservoir.

The drainage narrows immediately east of Hampton Boat Ramp, and vegetation plays a stronger part in screening the landscape from view. Across the Reservoir the view is dominated by horizontal rock formations with grass and small species of woody vegetation growing between them.

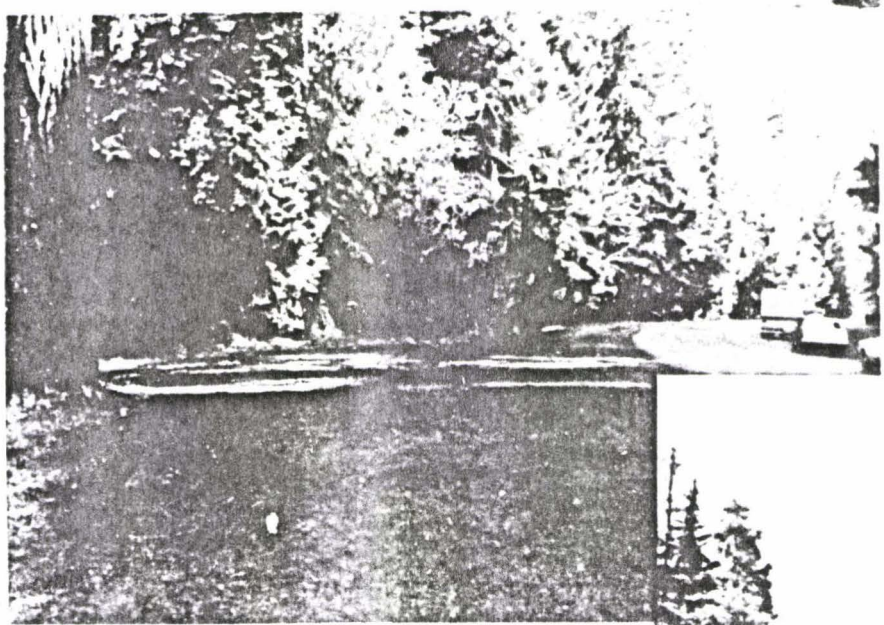
Short stretches of "canopied" and "detail" landscapes seem to alternate with small "enclosed" landscapes. Views are restricted by the closed-in canyon or "canopied" landscape.

The viewshed expands into a small "enclosed" landscape (Buckhead) where the view is extended into the small basin.

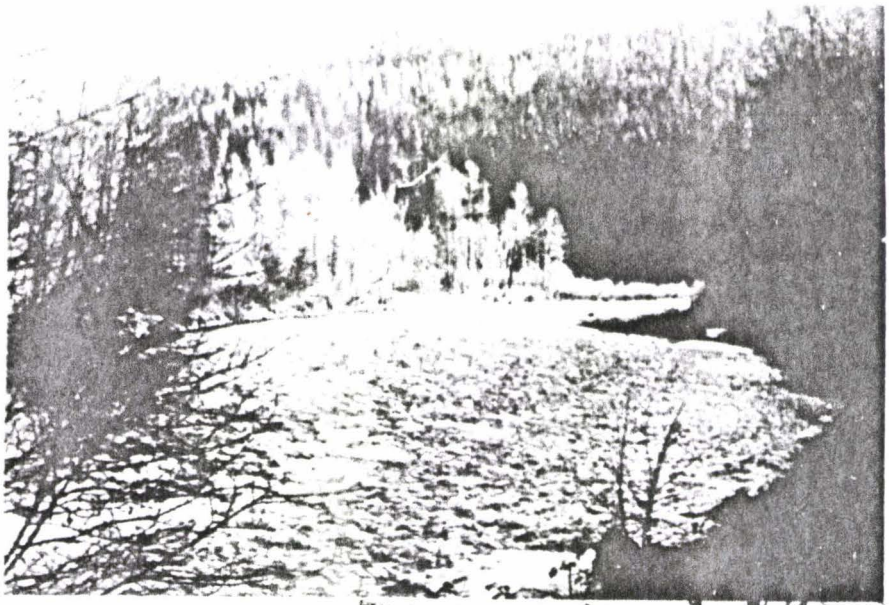
Proceeding along the road through this area one can see the river as it slowly meanders, rushes through rapids, and crosses a cobbled rock covered river bottom. The contrast between hardwood riparian, and coniferous vegetation is very evident.

The landscape from here to the Forest boundary is "enclosed", with occasional views of the river. Two small streams cross the highway in this enclosed landscape. The viewing time is very short but adds immensely to the travelers experience because of the cascading water in a heavily forested setting. The "detail" landscape is evident on the uphill side of the highway and provides a

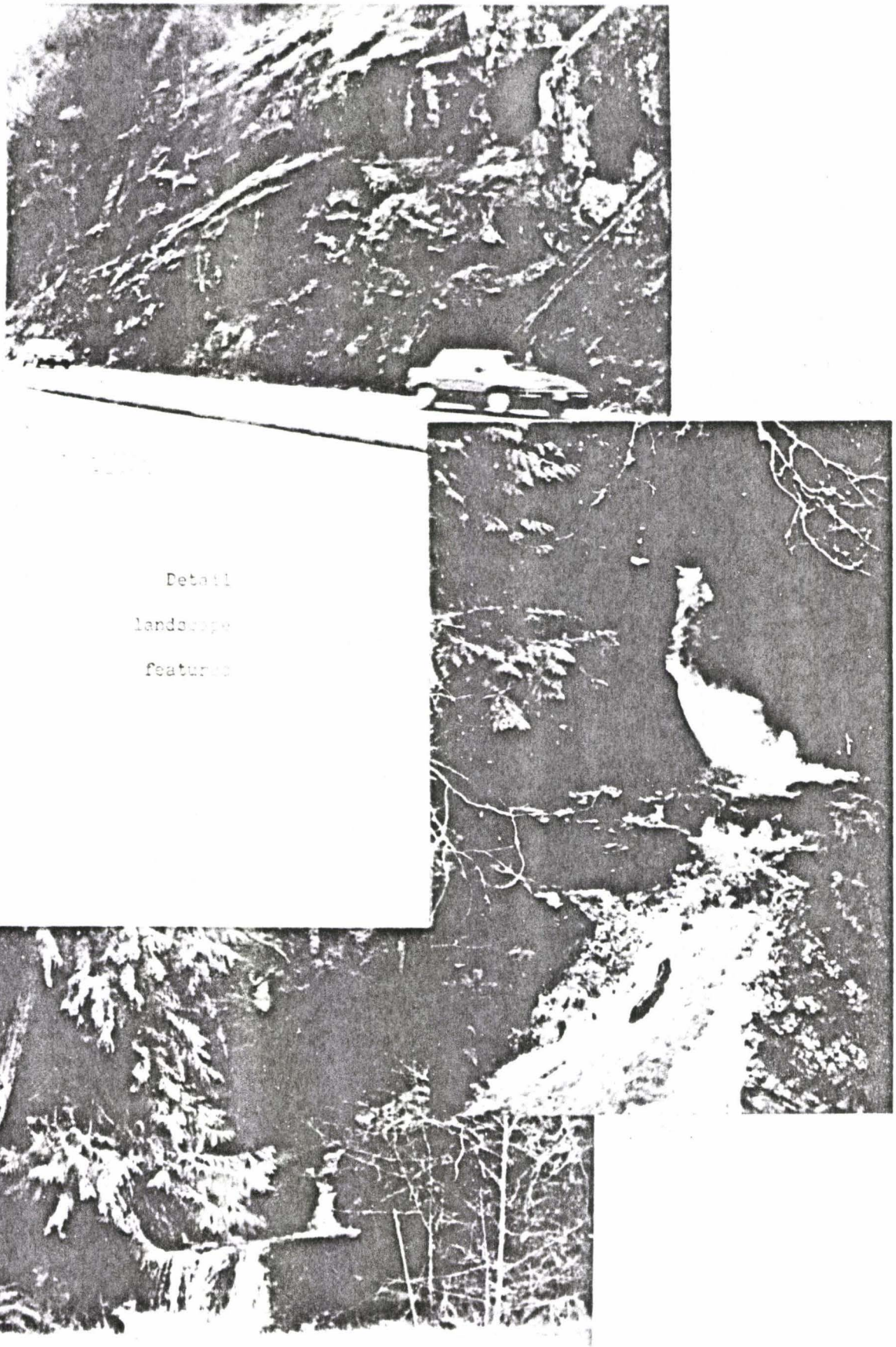
Horizontal rock outcrops and natural openings



Larger vegetation begins



Views of Middlefork Willamette river in Buckhead area



Detail

landscape

features

lot of variety. Several large diameter trees exist through this portion of the viewshed.

The Existing Sequence of Visual Experiences as the traveler goes from east to west is a reverse of the above.

SEQUENCE OF DESIRED VISUAL EXPERIENCES

The Desired Sequence of Visual Experiences identifies the opportunities available to manage the viewshed enhancing the visitors visual experience.

The portion of the viewshed from the west Forest boundary to Hampton Boat ramp will remain as is (refer to Existing Sequence of Visual Experiences as described above) because of the location and proximity of the road and the railroad. From Hampton Boat Ramp to the Lowell and Oakridge District boundaries on the east there are several opportunities to manage the roadside vegetation to provide and/or maintain views of interesting natural features, and to perpetuate growth of large diameter (24" d.b.h. and larger) trees within view of the traveler. Management of the viewshed should emphasize maintaining views of the horizontal rock outcrops, natural openings, the river in various moods, and a variety of vegetation as is depicted today. All management activities are to be planned using the landscape management techniques available.

A variety of "compositional landscape types" should be maintained and developed where opportunities exist. These compositional landscape types should include

detail, feature, enclosed, and focal landscapes. A "Desired Sequence of Visual Experiences" map shows the opportunities for each of these compositional landscape types. A comparison of the "Existing" and "Desired" Sequence of Visual Experience maps will assist management of the resources in the viewshed and at the same time achieve the highest possible visual management.

The sequence of desired visual experiences and the viewshed goal are to be used together to determine the proper intensity and location of proposed management activities.

NEED FOR QUANTITATIVE AND QUALITATIVE STANDARDS IN VIEWSHED MANAGEMENT

The characteristic landscape describes the middle-ground as "a solid or closed canopy of predominantly coniferous trees". Most management activities on the Forest are timber sales or directly related. Within viewshed boundaries these activities have the potential of being seen from the highway. It is important that the quantitative intent of the Forest Land Use Plan as well as the visual objectives (qualitative) be met in each management activity.
The Willamette National Forest Land Use Plan and the Forest Timber Plan assign tree crop rotations in years of: 100 to "General Forest"; 120 to "Scenic I"; and 180 to "Scenic II".

Percentages of acres of tree size classes desireable for each size class, (i.e., ND (nondiameter) = 0" to .4" d.b.h., SS (seedling/sapling) = .5" to 4.9" d.b.h., PL (pole timber) = 5" to 8.9" d.b.h., MS (small saw timber) = 9" to 20.9" d.b.h., and LS (large saw timber) = 21" and larger d.b.h.) have been assigned to each Land Use Allocation. Maintaining acreages of each timber size class in

accordance with the desirable percentages will insure an even distribution of quantitative management activities.

Locations which have the capabilities of growing the desired large diameter characteristic Douglas-fir can be identified and managed to do so in the immediate foreground in the Scenic I land use allocation. (See Willamette National Forest Land Use Plan and National Forest Landscape Management, Volume 2, Chapter 5, Timber, USDA FS Agriculture Handbook No.559, pages 50 and 146-171). The computer portion of this document describes a method by which the quantitative and qualitative requirements can be accomplished in harmony.

SUB DRAINAGES

It is a common practice on the Willamette to use subdrainage boundaries as timber sale areas. Several subdrainages are sometimes used to form the needed land base for a timber sale. Therefore, we are using subdrainages as "Visual Design Units".

IV. TRI DATA IN FT. COLLINS COMPUTER BANK

IV. "TRI" DATA IN FORT COLLINS COMPUTER BANK 31

A. STRUCTURE OF DATA IN TRI 33

B. SUB DRAINAGE BOUNDARIES / VIEWSHED BOUNDARIES AND ZIDENT CODES 33

C. ACCESSING AND RETRIEVING TRI INFORMATION 35

STRUCTURE OF DATA IN TRI

The following process describes how the TRI (total resource information) data is accessed, updated, and utilized to determine if a subdrainage is over treated, at optimum treatment, or under treated. The use of the computer is essential to be able to retrieve and display data as it exists today. For upcoming timber sales the computer can project into the future to provide information for timber sale planning that will assist the land managers in maintaining the balance of timber size classes and distribution of those classes in accordance with the land use plan. The use of a computer to map timber size classes on a subdrainage basis will also be described.

SUBDRAINAGE BOUNDARIES, VIEWSHED BOUNDARIES, AND ZIDENT CODES

Because the subdrainage boundary extends beyond the visible portion of many subdrainages, it was determined that TRI data, only in those portions of each subdrainage within the viewshed, should be retrieved and used. Viewshed boundaries were placed on the TRI information overlay at each Willamette National Forest District office.

Existing cell boundaries were used where they were close to the actual viewshed boundary. This was done to limit the number of cells that would have to be split. Zident codes, containing two characters, were assigned to each viewshed. The codes for the Willamette National Forest range from 11 to 20.

To be assured that the land manager is aware of the true viewshed boundaries, another map layer was added to the TRI base. The base for this map is an ortho photo with the viewshed boundaries and VAC (visual absorption capability) mapped on it. When TRI is reinstalled after the Forest plan is adopted, the actual viewshed boundaries will be available to the Districts so they can be included in that reinstallation.

After placing the viewshed boundaries on the TRI information overlay, the Zident Code was assigned to each cell within the viewshed. In many situations it was easier to assign Zident Codes to each cell and then identify the cells outside of the viewshed and delete the code from the smaller number of cells.

ACCESSING AND RETRIEVING "TRI" INFORMATION

A listing of each cell was obtained from Fort Collins containing the TRI compartment and Zident Code. Following is the query used to obtain this list:

```
RUN,R/BS   Y O U R   N U M B E R   E T C    ,60,999

@SYM PRINT$,,Y O U R   P A S S W O R D

@ MSG,N GIVE TO   Y O U R    N A M E
@XQT S2K*S2K.S2K/CB
          COPYRIGHT SAS INSTITUTE INC 1985
D A T E    00:53:29  BEGIN SYSTEM 2000 RELEASE 3.0A

USER,TRI:SHARED DBN IS CELL:
-556- OPENED.....CELL                          24    27999   DATE  TIME

ECHO ON:

LIST/REPEAT SUPPRESS, TITLE(131)D(49)WATERSHEDS BY COMPARTMENT, F(55)/

C63,C5,C16,C19,C70,OB C63,C15 WH C70 EQ 11*20:
```

When the list comes from Ft Collins this is what it should look like:

*	WSHED	COMP NR	CELL NR	CELL AC	ZIDENT
	1709000119F	6005	83	36	18
	1709000119F		84	4	18
	1709000119F		85	11	18
ETC..ETC..					

This list of cells can be used to make sure that this and subsequent lists of cells contain all of the cells in a compartment and subdrainage.

V. COMPUTER PROCESSES

V. COMPUTER PROCESSES 36

A. COMPUTER QUERYS AND PROGRAMS USED TO RETRIEVE TREE SIZE CLASSES FROM FT. COLLINS COMPUTER CENTER AND PROCESS THAT DATA 38

1. TREE SIZE/LAND USE ALLOCATION/SUBDRAINAGE INFORMATION 38

2. UPDATING "TRI" INFORMATION 38

3.FLOW CHART 40

4. RETREIVING UPDATED INFORMATION FROM FT. COLLINS IN DESIRED FORMAT 41

5. PROCESSING "TRI" DATA ON THE DATA GENERAL 41

6. USING THE "PRESENT" PROGRAM 42

7. VAC (VISUAL ABSORPTION CAPABILITY) 42

8. VIEWSHED MANAGEMENT DOCUMENTATION 44

B. TIMBER STAND TREATMENT STATUS 47

C. CAD (COMPUTER AIDED DRAWING) 48

D. HP_DG CONNECTION 49

E. SAMPLE "PRESENT" PRINTOUTS, "CAD" DRAWINGS AND "PERSPECTIVE PLOTS" 52

V. COMPUTER PROCESSES 36

A. COMPUTER QUERYS AND PROGRAMS USED TO RETRIEVE TREE SIZE CLASSES FROM FT. COLLINS COMPUTER CENTER AND PROCESS THAT DATA 38

1. TREE SIZE/LAND USE ALLOCATION/SUBDRAINAGE INFORMATION 38

2. UPDATING "TRI" INFORMATION 38

3.FLOW CHART 40

4. RETREIVING UPDATED INFORMATION FROM FT. COLLINS IN DESIRED FORMAT 41

5. PROCESSING "TRI" DATA ON THE DATA GENERAL 41

6. USING THE "PRESENT" PROCRAM 42

7. VAC (VISUAL ABSORPTION CAPABILITY) 42

8. VIEWSHED MANAGEMENT DOCUMENTATION 44

B. TIMBER STAND TREATMENT STATUS 47

C. CAD (COMPUTER AIDED DRAWING) 48

D. HP_DG CONNECTION 49

E. SAMPLE "PRESENT" PRINTOUTS, "CAD" DRAWINGS AND "PERSPECTIVE PLOTS" 52

COMPUTER QUERYS AND PROGRAMS USED TO RETRIEVE TREE SIZE CLASS DATA FROM FT. COLLINS COMPUTER CENTER AND PROCESS THAT DATA

TREE SIZE/LAND USE ALLOCATION/SUB DRAINAGE INFORMATION

The following query is used to retrieve tree size classes from the Fort Collins Computer Center:

```
@RUN,    Y O U R    A C C T   N O.   ,60,5000/5000
@SYM PRINT$,,FCRO44
@MSG,N GIVE TO  (YOUR NAME)
@ADD TRI6*CELL.SIGNON295
LIMIT 0,1:
LI/REPEAT SUPPRESS,TITLE(131)D(40)INFO FOR VIEWSHED BY COMPT-CELL,F(55),
R(4)COMP+ NR ,B(1),R(3)CE+&+GR,B(0),L(2)LL++ID,B(2),L(5)CELL+ACRES,B(1),
L(4)YEAR+ OF+ORIGIN,B(1),L(3)SL-+OPE,B(1),L(3)EX-+POS,B(1),L(4)ELEV,B(1),
L(4)SOIL,B(1),L(3)LND+CLS,B(1),L(1)O+W+N,B(1),R(6)ECO- +CLASS ,
B(1),L(4)SIDX,B(1),L(2)SP,B(1),
L(2)TR+CL,B(1),L(3)MJR+SPP,B(1),L(2)TR+SZ,B(1),R(2)D+B+H,B(1),L(3)TR+STK,
B(1),R(3)TPA,B(1),L(3)BA+PER+AC,B(1),L(3)MBF+PER+AC,B(1),L(4)MDIR+CODE,
B(1),L(5)PRACT+CODE,B(1),L(5)PRACT+YEAR,B(1),L(5)OPACT+CODE,B(1),L(5)CPACT+@
CODE,B(1),L(5)CPACT+YEAR/C5,C16,C17,C19,C154,C22,C23,C24,C25,C73,C20,
C29,C41,C42,BY CELL,C143,C144,C146,C147,C150,C151,C152,C153,C88,C91,
C94,C97,C101,C103,OB C15 WH C63 EQ 1709000119A AND C70 EQ 17:
```

The extent of the information asked for by the above query may be more than is needed, review it for your particular needs. The printout this creates should appear in the following format:

CELL INFO FOR VIEWSHED BY COMPT-CELL
TODAYS DATE

* COMP NR	CELL & GRID	CELL ACRES	YEAR OF ORIG	SL-OPE	EX-POS	ELEV	SOIL	LND CLS	O W N	ECO-CLAS	SIDX	SP	TR CL	MJR SPP	TR SZ	D B H	TPA
6005	81C4	2		80	S	1200	3	330	X	CH							
	82C4	14		30	SW	1200	3	432	T	CHSI			M	DF	LS		

BA PER AC	MBF PER AC	MDIR CODE	PRACT CODE	PRACT YEAR	OPACT CODE	CPACT CODE	CPACT YEAR
		VCN					
		VCN					

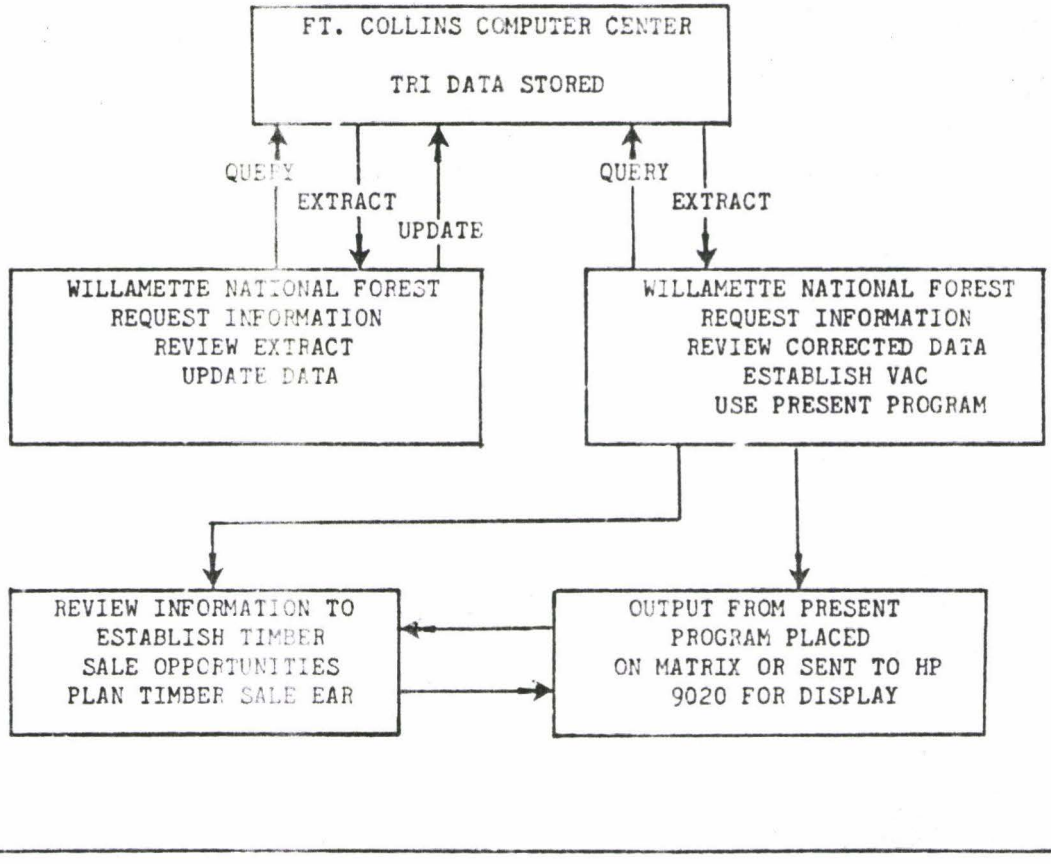
UPDATING TRI INFORMATION

Information on this extract is reviewed and compared to the ZIDENT code list to verify that each cell is listed and checked for missing information (i.e., year

of origin, TCAT, etc.). All missing information is collected and entered into the TRI data base at Fort Collins Computer Center. Information desired may vary from the sample query which is all inclusive. A review of data needed is essential prior to making the query.

COMPUTER PORTION OF VIEWSHED PROCESS

FLOW CHART



RETREIVING UPDATED INFORMATION FROM FT. COLLINS IN DESIRED FORMAT

When all information has been updated at Ft Collins the following query is used to retrieve the data in complete form:

```
ECHO ON:
---
>LIST/REPEAT SUPPRESS,TITLE(131)D(55)LANDSCAPE ARCHITECT DOCUMENTATION,
---
R(7)  CELL +  KEY  ,B(3),R(5)CELL +ACRES,B(3),R(5)SLOPE,B(3),
---
R(5)SOIL ,B(3),R(11) WATERSHED ,B(3),R(6)ZIDENT,B(3),L(4)TCAT,B(3),
---
R(5)TREE +CLASS,B(3),R(6) YEAR +ORIGIN/C15,C19,C22,C25,C63,C70,C71,
---
BY C14,C143,C154,OB C15,C71 WH C70 EQ 18 AND C63 EQ 1709000119F AND
---
(C20 EQ X OR C20 EQ R OR C20 EQ T) AND C5 EQ 6005:
```

PROCESSING "TRI" DATA ON THE DATA GENERAL COMPUTER

The information below is the refined information transferred to the computer program which established VAC and prepares the information used in PRESENT.

03/17/1986

* CELL KEY	CELL ACRES	SLOPE	SOIL	WATERSHED	ZIDENT	TCAT	TREE CLASS	YEAR ORIGIN
***								
* 6005081	2	80	3	1709000119F	18		M	1835
* 6005082	14	30	23	1709000119F	18	SA	M	1835
* 6005083	36	50	23	1709000119F	18		M	1835
* 6005091	8	50	21	1709000119F	18	TS	M	1835
* 60050[illegible]	15	60	23	1709000119F	18		M	1835
* 6005108	20	40	15	1709000119F	18		M	1835
* 6005112	72	80	210	1709000119F	18		M	1780
* 6005113	155	60	21	1709000119F	18	TS	M	1780
* 6005114	21	60	210	1709000119F	18		M	1835
* 6005115	30	40	3	1709000119F	18		M	1835
* 6005116	44	60	21	1709000119F	18	TS	M	1780

VAC (VISUAL ABSORPTION CAPABILITY)

This information is then transferred to the PRESENT program where the following occurs:

The data from Ft Collins contains the SRI (soils resource inventory) number and the percent of slope for each cell.

The VAC (visual absorption capability) is then determined for each cell in the following manner:

The SRI number is given a pre-determined value or number ranging from 3 to 8;

The slope is also given a value based on steepness (0-30 percent slopes are given the value of 3, 31-60 percent slopes are given the value of 2, and 61+ slopes are given the value of 1).

The assigned value for the SRI is multiplied by the assigned value for the slope resulting in a number from 3 to 27. High VAC is 18-27, Moderate VAC is 10-17, Low VAC is 3-9.

A list of the "VISUAL ABSORPTION COMPONENTS FOR THE WILLAMETTE NATIONAL FOREST" can be found on the following page.

VISUAL ABSORPTION COMPONENTS FOR WILLAMETTE NATIONAL FOREST

(A) SOIL CONTRAST RATING
H Low Contrast
M Moderate
L High Contrast

(B) SOIL NATURAL STABILITY
H Stable
M Moderate
L Unstable

(C) SOIL POTENTIAL FOR REGENERATION
H High Potential
M Moderate
L Low Potential

LANDTYPE NUMBER	A	B	C	
0	-		N/A	
1	M	H	N/A	5
2	L	H	N/A	4
3	M	M	L	5
4	H	H	N/A	6
5	H	H	L	7
6	H	H	N/A	6
7	M	H	N/A	5
8	L	M	L	4
9	L	M	L	4
12	M	H	H	8
13	M	H	H	8
14	L	H	H	7
15	H	H	M	8
16	M	H	M	7
17	H	H	M	8
19	M	H	M	7
21	L	H	L	5
22	L	H	H	7
23	L	M	H	6
25	L	L	H	5
31	L	H	M	6
33	M	M	H	7
35	M	L	H	6
44	M	H	M	7
54	M	H	M	7
55	M	M	M	6
56	M	H	M	7
57	M	H	M	7
61	M	H	L	6
62	H	H	L	7
63	M	H	M	7
64	M	H	M	7
66	M	H	M	7
67	M	H	L	6
68	H	H	L	7
69	H	H	L	7
71	M	H	L	6
73	M	H	L	6
74	M	H	L	6
75	M	H	L	6
81	H	H	L	7
82	H	H	L	7
85	H	H	L	7
91	M	H	L	6
92	M	H	L	6
93	M	H	L	6
94	M	H	L	6
95	M	H	L	6
132	M	H	H	8
133	M	M	H	7
134	M	H	M	7
135	M	M	M	6
137	M	H	M	7
142	L	H	H	7
143	L	M	H	6
145	L	M	H	6
157	M	H	M	7
161	M	H	M	7
162	M	H	M	7
163	M	M	M	6
164	M	H	M	7
165	M	M	M	6
166	M	M	M	6
167	M	H	M	7
168	M	H	M	7
169	M	H	M	7
194	M	H	M	7
195	M	H	M	7
201	L	H	L	3
202	L	H	L	5
203	L	H	L	5
204	L	H	L	5
210	L	H	L	5
212	L	H	M	6
213	L	M	M	5
214	L	H	L	5
215	L	H	L	5
216	L	H	L	5
225	L	M	H	6
231	L	H	H	7
232	L	H	M	6
233	L	M	H	6
234	L	H	H	7
235	L	M	H	6
236	L	H	H	7
237	L	M	H	6
238	L	H	M	6
251	L	L	H	5
252	L	L	H	5
253	L	L	H	5
254	L	L	H	5
255	L	L	H	5
256	L	L	H	5
261	L	H	M	6
301	L	H	M	6
302	L	H	L	5
303	L	H	L	5
304	L	H	L	5
305	L	M	M	5
310	L	H	L	5
313	L	M	M	5
331	M	M	M	6
332	M	M	M	6
333	M	M	H	7
334	M	L	H	6
335	M	L	H	6
336	M	M	H	7
337	M	M	M	6
353	M	L	H	6
356	M	H	H	8
441	M	H	L	6
443	M	M	M	6
444	M	H	M	7
446	M	H	M	7
447	M	H	M	7
553	M	M	M	6
554	M	M	M	6
559	M	M	M	6
563	M	M	M	6
564	M	H	M	7
601	M	H	L	6
602	M	H	L	6
603	M	H	L	6
604	M	M	M	6
605	M	H	L	6
606	M	H	L	6
607	M	H	L	6
608	M	H	L	6
610	M	H	L	6
614	M	H	L	6
615	M	H	L	6
616	M	H	M	7
617	M	M	M	6
633	M	H	M	7
641	M	H	M	7
644	M	H	M	7
646	M	H	M	7
710	M	H	L	6
714	M	H	L	6
731	M	H	L	6
736	M	H	L	6
737	M	H	L	6
740	M	H	L	6
741	M	H	L	6
812	H	H	L	7
821	H	H	L	7
825	H	H	L	7
852	H	H	L	7
910	M	H	L	6
914	M	H	L	6
920	M	H	L	6
923	M	H	L	6
924	M	H	L	6
926	M	H	L	6
932	M	H	L	6
940	M		L	6
941	M	H	L	6
942	M	H	L	6
954	M	H	L	6

The updated TRI data extract is processed in a computer program prior to being used in PRESENT. For information concerning the processing program contact Nora Holmquist.

Below is an abreviated account of the general process used to prepare the data for use in PRESENT, as well as how to use PRESENT to display the data.

Viewshed Management Documentation

1. Extract enough data from TRI to calculate year of origin and verify the rest of the data. (See TRI extract #1 below).

2. Calculate year of origin and site class and update TRI with this information.

3. Extract the data from TRI to use with the Viewshed Management program (See TRI extract #2 below).

4. Calculate a VAC for each record in the file from step #3:

   Log in as user

   Type: DIR VIEWSHED

   Type: CREATE_VAC

This program creates a VAC for each line in the data file. A copy of your data file is made which includes the calculated VAC ratings in an output file which has the same name as your data file with the VAC extension.

- Any line that does not have a tree class of either M, I or C is skipped.

- The program begins its calculations on the first line after the line that begins with "*** ".

- The program ends its calculations on the first line that begins with "--- ".

- If the Year of Origin is blank, the program looks at the next line. If the next line has a blank cell_key and has a non-blank year of origin, this year of origin is used with the previous line.

5. You are ready to run reports on your database using PRESENT.

To Run A Report Using PRESENT:

1. Log in as user

2. Type: DIR VIEWSHED (you only need to do this once, if you are not sure, type DIR, if :D2:UDD:RECREATION:VIEWSHED appears you are ready for step 3.

3. Type: PRESENT

4. Type: INPUT FILE filename FORMAT VIEWSHED.DF where filename is the name of your output file from step #4 above

5. To list reports you can run, type: MACROS

6. To run a report, type: the name of the report macro you wish to run (see below)

7. To run another report, type: the name of the report macro you wish to run

8. To save just a list of cells from the report you just ran (to be used with the HP9020), type: FILE filename (ex. FILE 119F_1977_1988) Since just a list of cells is stored, you will want to give the file a descriptive filename.

9. To print a report, type: PRINT ON @printername (ex PRINT ON @LQP)

10. To exit from PRESENT, type: BYE

Report Macros You Can Run

ACRES_BY_VAC - lists all the cells sorted by VAC, with an acre subtotal for each VAC

ACRES_BY_LUA - lists all the cells sorted by LUA, with an acre subtotal for each LUA

ACRES_IN_ONE_LUA - lists all the cells in one LUA, with an acre subtotal

ACRES_IN_ONE_VAC - lists all the cells in one VAC, with an acre subtotal

YEAR_SUB - lists all the cells in one subdrainage, within a range of year of origins, sorted by VAC within LUA with acre subtotals for each group.

Names Of The Data Items In The File

```
01  CELL_RECORD,
    02 CELL_INFO,
       03  SUBDRAINAGE        CHAR (4),
       03  FILLER1            CHAR (1),
       03  COMP               CHAR (4),
       03  CELL               CHAR (3),
       03  FILLER4            CHAR (1),
       03  NF_ACRES           UNPACKED DECIMAL (5),
       03  FILLER5            CHAR (1),
       03  YEAR_OF_ORIGIN     CHAR (4),
       03  FILLER6            CHAR (1),
       03  LUA                CHAR (2),
       03  FILLER7            CHAR (1),
       03  VAC                CHAR (1),
       02 FILLER8             CHAR (1).
```

Files Needed:

Create_vac.doc
Create_vac.cli
Create_vac.pr
Soil_vac_rating_table - Visual absorption components.
Converts SRI number to soil vac rating.
The format for each line is:
col 1-5 is the SRI number left justified, col 6 is blank, col 7 is the soil vac rating
viewshed.df

Using the PRESENT program the data can be organized as follows: (This format is the same one found on several of the viewshed forms in the appendix. Information from PRESENT can be placed on any form which displays the information desired.)

SUBDRAINAGE 119F (BUCKHEAD)

TRI Compartment Number	Cell Number	Acres N.F. Land	Year Of Origin	Land Use Allocation	VAC

Using PRESENT many combinations of information can be derived from the data. For example: "List all cells having a YEAR OF ORIGIN between 1981 and 1989 in SCI"; Or, "List all cells in HIGH VAC"; etc.

TIMBER STAND TREATMENT STATUS

To determine the timber stand treatment status of a subdrainage the display shown above is needed which lists all cells in each land use allocation and provides the total acres of each listing. This information can be placed on any of the forms found in the appendix. The status can be determined for any point in time (usually within five or six years of todays date) and should use, as a basis, the time (years) it takes to grow a tree .5" d.b.h. in the sale planning area. The average number of years it takes to grow a tree that large on the Willamette National Forest is 8 years. A list of cells with the year of origin within that 8 years are the ND or non diameter trees for that subdrainage and land use allocation. To determine the status the Matrix in the appendix including VAC can be filled out.

If the percent of the ND acres in any land use allocation exceed the optional percent, that area is over treated, and further treatment should be deferred until the percent of acres is low enough that the planned activity does not

result in over treatment. (It must be noted that the projection of the timber stand treatment status may not be the actual situation due to unforseen problems).

CAD (COMPUTER AIDED DRAWING)

The Hewlett Packard (HP) 9020 computer may be used to plot TRI cells for observation and for planning the location of proposed management activities.

The CAD (computer aided drafting) program has the capability to display data transferred from the DG. The subdrainage map can be the base map. Each cell is digitized using the polygon drawing command. Cell numbers or keys are assigned to each cell so individual cells can be mapped separately when needed. Stand status information can then be mapped for separate size classes as they are today or in the future. The distribution of ND cells and SS cells would prove very useful for locating proposed timber sale units.

The following process is used to obtain the capability of transferring lists of cells from the DG to the HP: It might be more expediant to enter cell numbers from the screen rather than transfer data until the transfer method has had all of the bugs taken out.

HP_CONFIGURATION

SET THE FOLLOWING PARAMETERS IN YOUR HP TTY PROGRAM:

PRINTER	4
HPIB	1
MODE	CHAR
GAP	2
BITS/CHAR	8
STOP BITS	1
PARITY	NONE
SPEED	9600
ECHO	NONE
ENQ/ACK	OFF
XON/XOFF	BOTH
MODEM	ORG

THESE SETTINGS CAN BE DONE EACH TIME ONE LOADS THE TTY PROGRAM (BY USING THE EDIT OPTION WITHIN TTY) OR ONE CAN CUSTOMIZE A VERSION OF TTY THAT WILL COME UP WITH THE CORRECT PARAMETERS AUTOMATICALLY. WITHIN THE TTY EDIT OPTION IS THE CHOICE OF A LISTING FILE. FOR RECORDING A FILE FROM THE DG, USE THE "CREATE" OPTION TO ESTABLISH THE FILE. THEN ONCE YOU LOG ON TO THE DG AND HAVE YOUR CLI PROMPT, TYPE "TYPE {filename}" ON THE CLI PROMPT AND JUST BEFORE YOU HIT THE RETURN KEY, PRESS THE "RECORD" OPTION. AS YOUR FILE SCROLLS ON THE SCREEN IT WILL BE RECORDED INTO YOUR LIST FILE. WHEN THE SCROLLING ENDS, PRESS THE "RECORD" OPTION ONCE MORE TO END YOUR LOGGING. YOU WILL PROBABLY END UP WITH A CLI PROMPT AT THE END OF YOUR FILE THAT WILL NEED TO BE DELETED. TO SEND A FILE BACK TO THE DG YOU WILL NEED TO CHANGE YOUR LIST FILE NAME TO THE NAME OF THE FILE TO SEND. ENTER IN "CREATE/I {filename} ON THE CLI PROMPT, AND THEN PRESS THE "UPLOAD" OPTION TO BEGIN TRANSMISSION. WHEN YOUR FILE IS FINISHED SCROLLING ENTER ")" ON COLUMN ONE OF THE CLI PROMPT; THIS WILL CLOSE YOUR FILE ON THE DG.

HP-TO-DG CABLE

WE HAVE A THREE-WAY SWITCH HOOKED UP TO THE RS-232 CABLE ON THE HP.
ONE IS CONNECTED TO A 1200 BAUD MODEM
ONE IS AVAILABLE FOR USER OPTIONS (HOOKING UP THEIR OWN MODEM, ETC)
ONE IS A NULL-MODEM CABLE CONNECTED TO A DEDICATED PORT ON THE DG

NULL-MODEM CABLE PIN-OUTS:

	---HP--- TERMINAL(*MALE)	---DG--- CPU (FEMALE)	
	2	3	
JUMPER 4,5	3	2	JUMPER 4,6,8
JUMPER 6,8,20	8	5	
	7	7	

* IT'S MALE GOING INTO 3-WAY SWITCH (FEMALE IF DIRECTLY INTO HP RS-232 CABLE)

DG CONFICURATION

INITIAL SET-UP (DONE ONCE)

CHOSE AN UNUSED IAC-16 PORT ON THE BACK OF THE DG.

INSERT "SET.ANSI 9600 @CON__" IN YOUR SETCONSOLES.CLI MACRO
(WHERE THE TWO SPACES ARE YOUR CON#)

```
.........................:FS:SET.ANSI.CLI.................................
comment  Macro to set the default characteristics for the Data General
comment  hardcopy terminals.
comment -- edited 1/8/85 by L.Cayous to set BREAK=DCOB

Comment
Comment -- To call this macro, you must use the following parameters:
Comment
Comment      Param 1 = Baud Rate
Comment      Param 2 = Console #
Comment
Comment    Example:  SET.ANSI 9600 @CON14

  ASSIGN %2%
  CHAR/DEF/CRT4/BAUD=%1%/BREAK=DCOB/ON/ULC/OFC/ON/NAS %2%
  DEASSIGN %2%

.....................................................................
```

RUN-TIME SET-UP (DONE EACH TIME)

MAKE SURE THAT THE PORT IS DISABLED WHENEVER ANY CONNECTIONS OR DISCONNECTIONS ARE PERFORMED. IF YOU HAVE A 3-WAY SWITCH, SWITCH OVER TO THE DG CABLE PRIOR TO ENABLING THE PORT. WHEN YOU ARE DONE WITH YOUR FILE TRANSFER FROM THE DG, LOGOFF THE DG AND THEN DISABLE THE PORT AND THEN MOVE YOUR 3-WAY SWITCH BACK.

The following insert is the latest information regarding transferring information from the DG to the HP. It should make the actual transfer very smooth.

If assistance is needed to accomplish the above contact Steve Brenner in the Willamette National Forest S.O.

TTY_TO_DG CONNECTION

HP CONFIGURATION

"/UTILS/TTY_TO_DG" WILL SET THE FOLLOWING PARAMETERS IN THE TTY PROGRAM:

PRINTER= 4	HPIB= 1	MODE= CHAR	GAP= 0	BITS/CHAR= 8
STOP BITS= 1	PARITY= NONE	SPEED= 9600	ECHO= LOCAL	ENQ/ACK= OFF
XON/XOFF=HOST	MODEM= OFF	INSEP= CR LF	OUTSEP= CR	LIST FILE=""

HP-TO-DG CABLE

WE HAVE A THREE-WAY SWITCH HOOKED UP TO THE RS-232 CABLE ON THE HP.
- ONE IS CONNECTED TO A 1200 BAUD MODEM
- ONE IS AVAILABLE FOR USER OPTIONS (HOOKING UP THEIR OWN MODEM, ETC)
- ONE IS A NULL-MODEM CABLE CONNECTED TO A DEDICATED PORT ON THE DG

NULL-MODEM CABLE PIN-OUTS:

---HP--- TERMINAL(*MALE)		---DG--- CPU (FEMALE)	
	2.....3		
JUMPER 4,5	3.....2		JUMPER 4,6,8
JUMPER 6,8,20	8.....5		
	7.....7		

* IT'S MALE GOING INTO 3-WAY SWITCH (FEMALE IF DIRECTLY INTO HP RS-232 CABLE)

DG CONFIGURATION

INITIAL SET-UP (DONE ONCE)

CHOSE AN UNUSED IAC-16 PORT ON THE BACK OF THE DG.

INSERT "SET.HP 9600 @CON__" IN YOUR SETCONSOLES.CLI MACRO
(WHERE THE TWO SPACES ARE YOUR CON#)

```
.........................:FS:SET.HP.CLI.................................
comment  Macro to set the default characteristics for the HP 9020
Comment -- To call this macro, you must use the following parameters:
Comment
Comment       Param 1 = Baud Rate
Comment       Param 2 = Console #
Comment
Comment     Example:  SET.HP 9600 @CON48

ASSIGN %2%
CHAR/DEF/HARDCOPY/BAUD=%1%/BREAK=DCOB/ON/ULC/NAS/OFF/EBO/OFC %2%
DEASSIGN %2%
.....................................................................
```

TTY_TO_DG CONNECTION (continued)

RUN-TIME SET-UP (DONE EACH TIME)

Make sure that the port is disabled whenever any connections or disconnections are performed. If you have a 3-WAY switch, switch over to the DG cable prior to enabling the port. When you are done with your file transfer from the DG, logoff the DG and then disable the port and then move your 3-WAY switch back.

TRANSFERING FILES

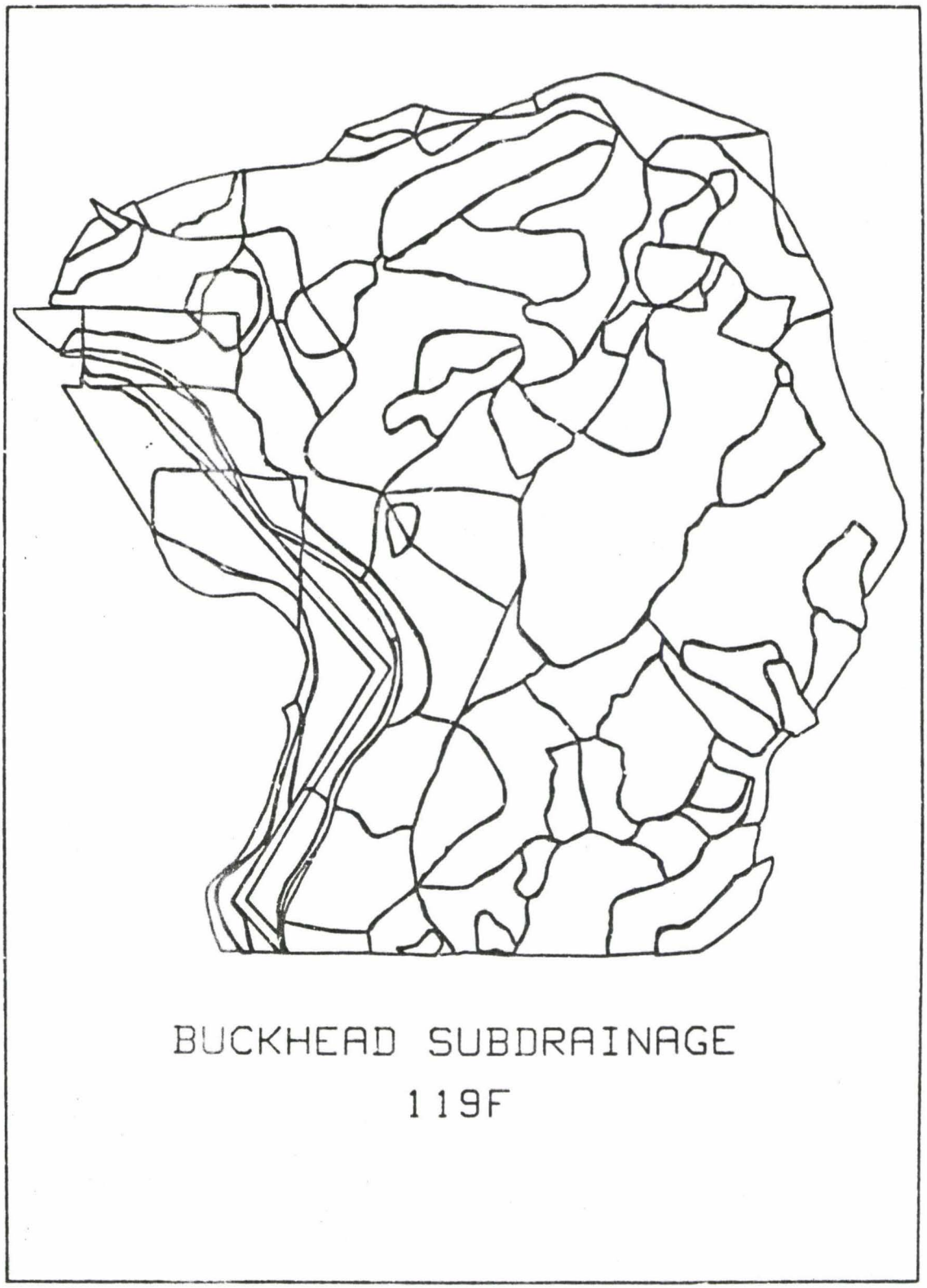
RECEIVING A FILE FROM THE DG

Within the TTY EDIT option is the Choice of a listing file. For recording a file from the dg, Use the "CREATE" option to establish the file. Then once you log on to the DG and have your CLI prompt, Type "TYPE {filename}" on the CLI prompt and just before you hit the return key, hit the "RECORD" option. As your file scrolls on the screen it will be recorded into your list file. When the scrolling ends, hit the "RECORD" option once more to end your logging. You will probably end up with a CLI prompt at the end of your file that will need to be deleted.

SENDING A FILE TO THE DG

To send a file back to the DG you will need to change your list file name to the name of the file to send. Enter in "CREATE/I {filename}" on the CLI prompt, and then hit the "UPLOAD" option to begin transmission (you will be asked if you want to use handshaking; just hit the return key for no handshaking). When your file is finished scrolling, enter ")" on column one of the CLI prompt; this will close your file on the DG.

Following are some sample "PRESENT" printouts and resulting maps produced by the "CAD" system depicting a variety of data and maps which can be produced through this process. Also shown are samples of "PERSPECTIVE PLOTS" of some of the "CAD" maps. These plots basically show the data stored in Ft Collins.



BUCKHEAD SUBDRAINAGE

119F

All Records Sorted By VAC with Acres Subtotaled and a Grand Total

Subdrainage	Cell	NF_Acres	Year_of_Origin	LUA
All Cells located in VAC L				
119F	081	2	1835	
119F	099	15	1835	
119F	112	72	1780	
119F	113	155	1780	TS
119F	114	21	1835	
119F	116	44	1780	TS
119F	127	4	1977	SA
119F	139	12	1835	
119F	140	19	1960	TS
119F	142	300	1960	TS
119F	177	20	1870	SA
119F	178	23	1870	
119F	188	25	1870	TS
119F	192	68	1870	SA
119F	200	119	1870	TS
119F	201	6	1978	TS
119F	203	40	1959	TS
119F	293	23	1983	TS
119F	294	22	1983	TS
119F	302	35	1787	TS
119F	305	31	1988	TS
Total Acres in VAC L		1,056		
All Cells located in VAC M				
119F	082	14	1835	SA
119F	083	36	1835	
119F	091	8	1835	TS
119F	108	20	1835	
119F	115	30	1835	
119F	117	62	1835	SA
119F	125	48	1780	SA
119F	132	46	1959	TS
119F	136	14	1978	TS
119F	137	22	1960	TS
119F	138	3	1965	TS
119F	141	10	1977	TS
119F	143	42	1960	TS
119F	144	28	1960	TS
119F	145	25	1966	TS
119F	146	14	1967	TS
119F	149	11	1970	TS
119F	154	80	1835	SA
119F	155	77	1835	TS
119F	176	10	1870	SA
119F	181	2	1870	SA
119F	187	76	1730	TS
119F	191	23	1870	TS
119F	194	46	1870	TS

1/3

All Records Sorted By VAC with Acres Subtotaled and a Grand Total

Subdrainage	Cell	NF_Acres	Year_of_Origin	LUA
119F	195	71	1730	TS
119F	196	13	1730	TS
119F	197	25	1730	TS
119F	198	243	1870	TS
119F	202	4	1960	TS
119F	209	28	1988	TS
119F	215	25	1784	
119F	231	16	1988	SA
119F	233	16	1988	SA
119F	234	4	1988	SA
119F	235	7	1988	SA
119F	236	1	1988	SA
119F	243	6	1988	TS
119F	244	5	1988	TS
119F	275	3	1870	TS
119F	280	5	1870	TS
119F	281	8	1870	TS
119F	282	9	1870	TS
119F	284	13	1784	TS
119F	286	3	1870	TS
119F	303	69	1988	TS
119F	304	29	1988	TS

Total Acres in VAC H 1,350

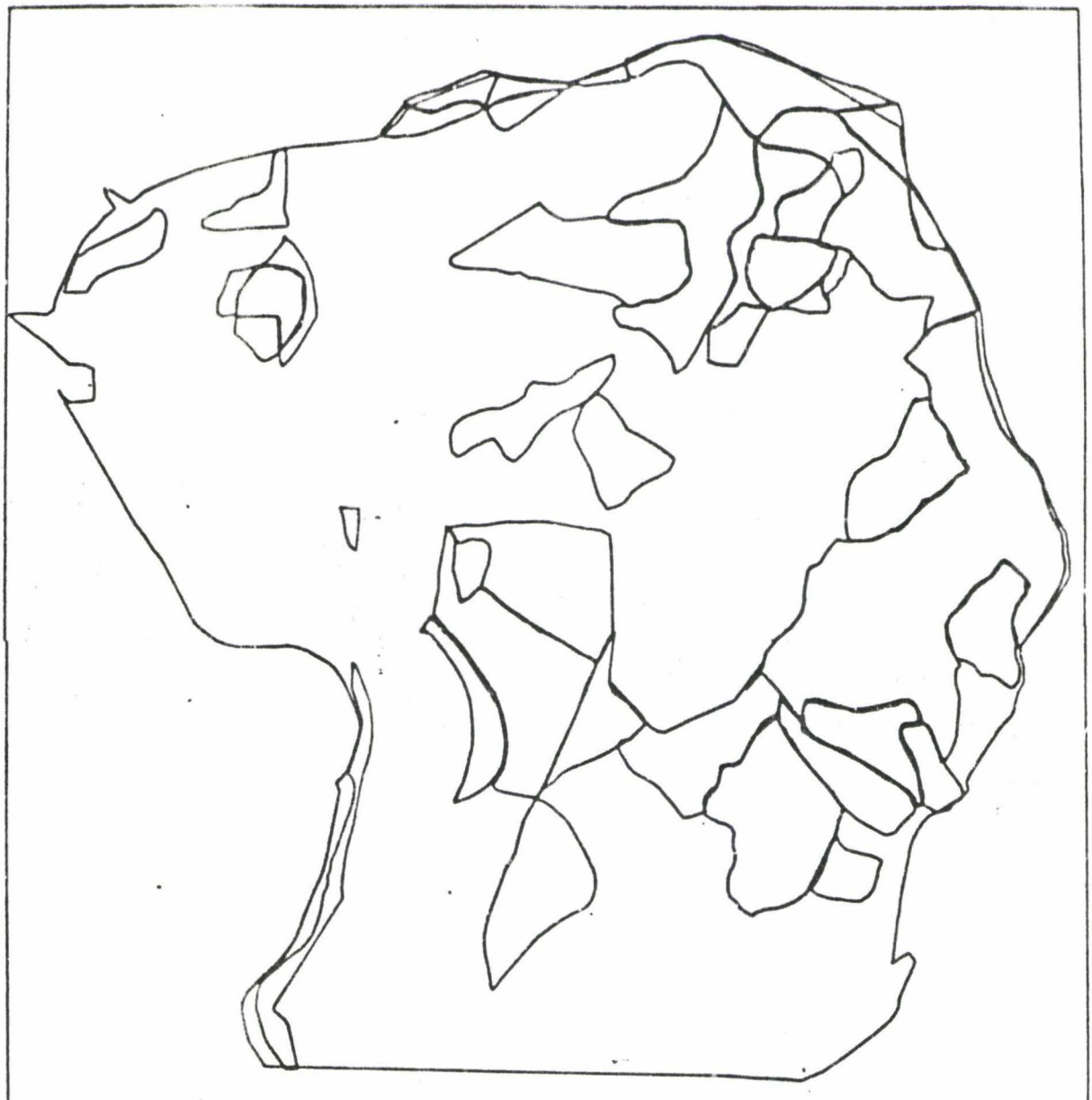
All Cells located in VAC H

119F	097	56		SA
119F	120	46		SA
119F	124	54	1780	SA
119F	126	18	1780	SA
119F	128	7	1978	TS
119F	129	10	1980	TS
119F	130	74	1958	TS
119F	131	87	1780	TS
119F	147	21	1870	TS
119F	148	16	1910	
119F	150	20	1974	TS
119F	151	53	1935	TS
119F	193	27	1730	TS
119F	214	8	1784	
119F	219	15	1967	TS
119F	232	3	1988	SA
119F	285	25	1960	TS
119F	287	6	1988	SA
119F	288	54	1870	SA
119F	295	29	1935	TS

Total Acres in VAC H 629

Total Acres 3,035

2/3



BUCKHEAD SUBDRAINAGE

MODERATE VAC 1350 ACRES

All Records Sorted By LUA with Acres Subtotaled and a Grand Total

Subdrainage	Cell	NF_Acres	Year_of_Origin	LUA	VAC
Scenic I					
119F	082	14	1835	SA	M
119F	097	56		SA	H
119F	117	62	1835	SA	M
119F	120	46		SA	H
119F	124	54	1780	SA	H
119F	125	48	1780	SA	M
119F	126	18	1780	SA	H
119F	127	4	1977	SA	L
119F	154	80	1835	SA	M
119F	176	10	1870	SA	M
119F	177	20	1870	SA	L
119F	181	2	1870	SA	M
119F	192	68	1870	SA	L
119F	231	16	1988	SA	M
119F	232	3	1988	SA	H
119F	233	16	1988	SA	M
119F	234	4	1988	SA	M
119F	235	7	1988	SA	M
119F	236	1	1988	SA	M
119F	287	6	1988	SA	H
119F	288	54	1870	SA	H
Total Acres in Scenic I				589	
General Forest					
119F	091	8	1835	TS	M
119F	113	155	1780	TS	L
119F	116	44	1780	TS	L
119F	128	7	1978	TS	H
119F	129	10	1980	TS	H
119F	130	74	1958	TS	H
119F	131	87	1780	TS	H
119F	132	46	1959	TS	M
119F	136	14	1978	TS	M
119F	137	22	1960	TS	M
119F	138	3	1965	TS	M
119F	140	19	1960	TS	L
119F	141	10	1977	TS	M
119F	142	300	1960	TS	L
119F	143	42	1960	TS	H
119F	144	28	1960	TS	M
119F	145	25	1966	TS	M
119F	146	14	1967	TS	H
119F	147	21	1870	TS	H
119F	149	11	1970	TS	M
119F	150	20	1974	TS	H
119F	151	53	1935	TS	H
119F	155	77	1835	TS	M
119F	187	76	1730	TS	M

1/3

All Records Sorted By LUA with Acres Subtotaled and a Grand Total

Subdrainage	Cell	NF_Acres	Year_of_Origin	LUA	VAC
119F	188	25	1870	TS	L
119F	191	23	1870	TS	M
119F	193	27	1730	TS	H
119F	194	46	1870	TS	M
119F	195	71	1730	TS	M
119F	196	13	1730	TS	M
119F	197	25	1730	TS	M
119F	198	243	1870	TS	M
119F	200	119	1870	TS	L
119F	201	6	1978	TS	L
119F	202	4	1960	TS	M
119F	203	40	1959	TS	L
119F	209	28	1988	TS	M
119F	219	15	1967	TS	H
119F	243	6	1988	TS	M
119F	244	5	1988	TS	M
119F	275	3	1870	TS	M
119F	280	5	1870	TS	M
119F	281	8	1870	TS	M
119F	282	9	1870	TS	M
119F	284	13	1784	TS	M
119F	285	25	1960	TS	H
119F	286	3	1870	TS	M
119F	293	23	1983	TS	L
119F	294	22	1983	TS	L
119F	295	29	1935	TS	H
119F	302	35	1787	TS	L
119F	303	69	1988	TS	M
119F	304	29	1988	TS	M
119F	305	31	1988	TS	L
Total Acres in General Forest		2,166			
The LUA is not in table					
119F	081	2	1835		L
119F	083	36	1835		M
119F	099	15	1835		L
119F	108	20	1835		M
119F	112	72	1780		L
119F	114	21	1835		L
119F	115	30	1835		M
119F	139	12	1835		L
119F	148	16	1910		H
119F	178	23	1870		L
119F	214	8	1784		H
119F	215	25	1784		M
Total Acres in The LUA is not in table		280			
Total Acres		3,035			

2/3

All Records Sorted By LUA with Acres Subtotaled and a Grand Total

Subdrainage	Cell	NF_Acres	Year_of_Origin	LUA	VAC
119F	188	25	1870	TS	L
119F	191	23	1870	TS	M
119F	193	27	1730	TS	H
119F	194	46	1870	TS	M
119F	195	71	1730	TS	M
119F	196	13	1730	TS	M
119F	197	25	1730	TS	M
119F	198	243	1870	TS	M
119F	200	119	1870	TS	L
119F	201	6	1978	TS	L
119F	202	4	1960	TS	M
119F	203	40	1959	TS	L
119F	209	28	1988	TS	M
119F	219	15	1967	TS	H
119F	243	6	1988	TS	M
119F	244	5	1988	TS	M
119F	275	3	1870	TS	M
119F	280	5	1870	TS	M
119F	281	8	1870	TS	M
119F	282	9	1870	TS	M
119F	284	13	1784	TS	M
119F	285	25	1960	TS	H
119F	286	3	1870	TS	M
119F	293	23	1983	TS	L
119F	294	22	1983	TS	L
119F	295	29	1935	TS	H
119F	302	35	1787	TS	L
119F	303	69	1988	TS	M
119F	304	29	1988	TS	M
119F	305	31	1988	TS	L

Total Acres in General Forest 2,166

The LUA is not in table

119F	081	2	1835		L
119F	083	36	1835		M
119F	099	15	1835		L
119F	108	20	1835		M
119F	112	72	1780		L
119F	114	21	1835		L
119F	115	30	1835		M
119F	139	12	1835		L
119F	148	16	1910		H
119F	178	23	1870		L
119F	214	8	1784		H
119F	215	25	1784		M

Total Acres in The LUA is not in table 280

Total Acres 3,035

2/3

BUCKHEAD SUBDRAINAGE

GENERAL FOREST

This will list all records with the VAC you select below:

Which VAC do you wish reported L, M, or H? H

A List Of All Cells With VAC H 6/16/86

Subdrainage	Cell	NF_Acres	Year_of_Origin	LUA
119F	097	56		SA
119F	120	46		SA
119F	124	54	1780	SA
119F	126	18	1780	SA
119F	128	7	1978	TS
119F	129	10	1980	TS
119F	130	74	1958	TS
119F	131	87	1780	TS
119F	147	21	1870	TS
119F	148	16	1910	
119F	150	20	1974	TS
119F	151	53	1935	TS
119F	193	27	1730	TS
119F	214	8	1784	
119F	219	15	1967	TS
119F	232	3	1988	SA
119F	285	25	1960	TS
119F	287	6	1988	SA
119F	288	54	1870	SA
119F	295	29	1935	TS

Total Acres 629

1/2

BUCKHEAD SUBDRAINAGE

HIGH VAC 629 ACRES

Enter the range of the Year of Origin and the Subdrainage to Find Acres Involved

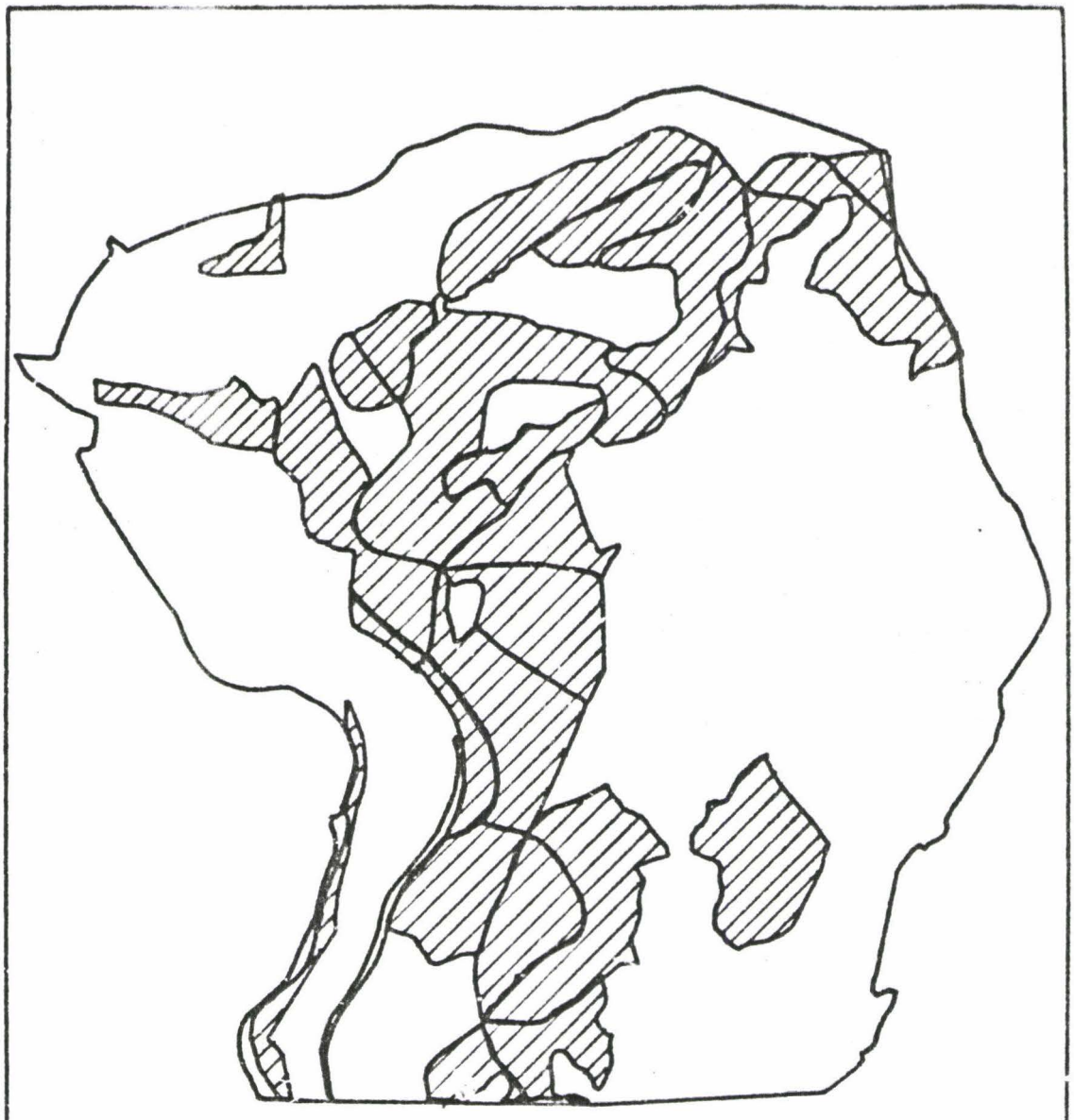
Enter Year of Origin, from: 1700 to: 1865 Enter Subdrainage: 119F

L.S.

Cell	NF_Acres	Year_of_Origin	LUA
Scenic I			
All Cells located in VAC M			
082	14	1835	SA
117	62	1835	SA
125	48	1780	SA
154	80	1835	SA
Total Acres in VAC M	204		
All Cells located in VAC H			
124	54	1780	SA
126	18	1780	SA
Total Acres in VAC H	72		
Total Acres in Scenic I		276	
General Forest			
All Cells located in VAC L			
113	155	1780	TS
116	44	1780	TS
302	35	1787	TS
Total Acres in VAC L	234		
All Cells located in VAC M			
091	8	1835	TS
155	77	1835	TS
187	76	1730	TS
195	71	1730	TS
196	13	1730	TS
197	25	1730	TS
284	13	1784	TS
Total Acres in VAC M	283		
All Cells located in VAC H			
131	87	1780	TS
193	27	1730	TS
Total Acres in VAC H	114		
Total Acres in General Forest		631	

Cell	NF_Acres	Year_of_Origin	LUA
LUA not in table			
All Cells located in VAC L			
081	2	1835	
099	15	1835	
112	72	1780	
114	21	1835	
139	12	1835	
Total Acres in VAC L	122		
All Cells located in VAC M			
083	36	1835	
108	20	1835	
115	30	1835	
215	25	1784	
Total Acres in VAC M	111		
All Cells located in VAC H			
214	8	1784	
Total Acres in VAC H	8		
Total Acres in LUA not in table		241	
Total Acres	1,148		

1/2

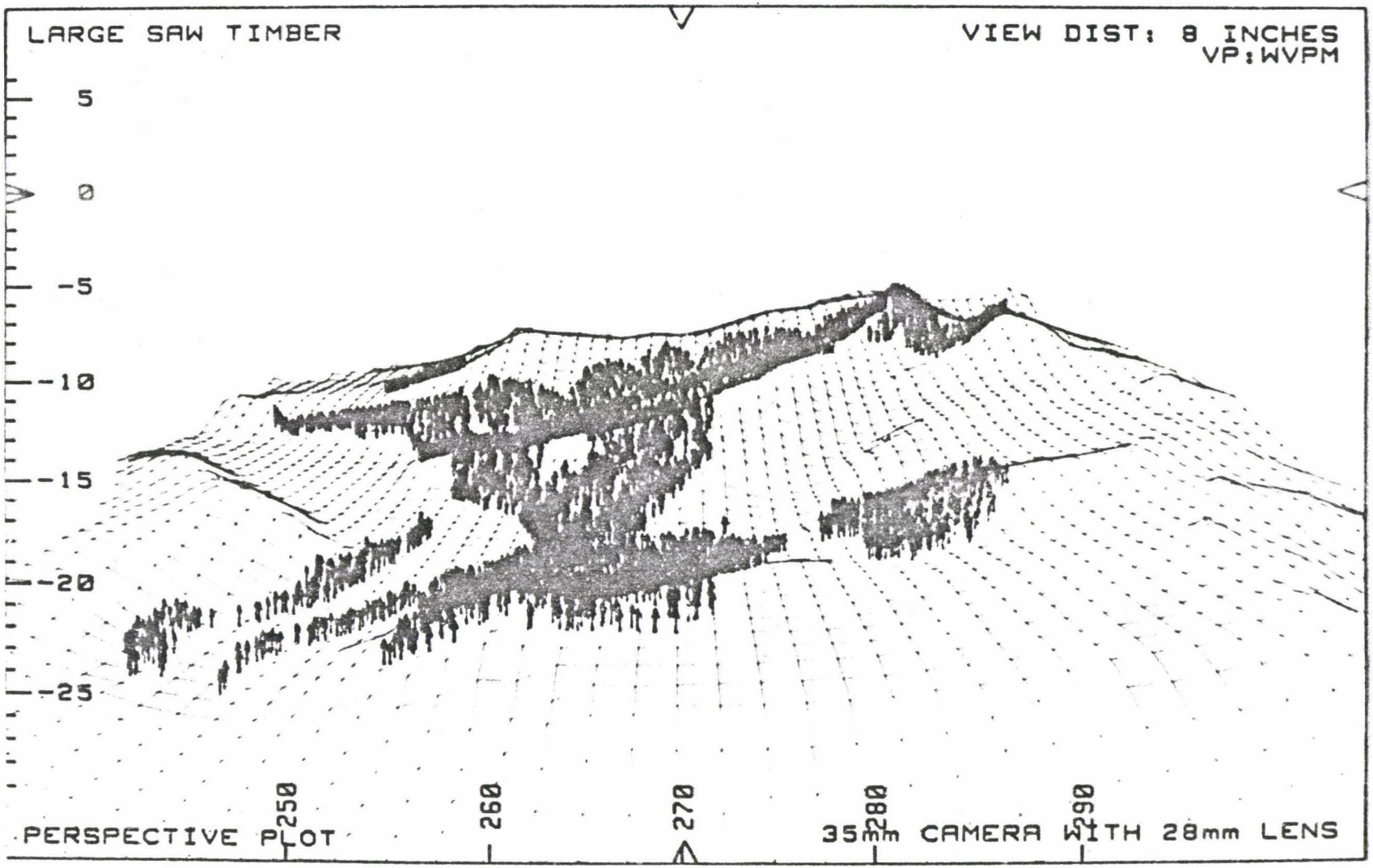


BUCKHEAD SUBDRAINAGE

119F

(LS) LARGE SAW

2/2


LARGE SAW TIMBER
VIEW DIST: 8 INCHES
VP:WVPM
5
0
-5
-10
-15
-20
-25
250
260
270
280
290
PERSPECTIVE PLOT
35mm CAMERA WITH 28mm LENS

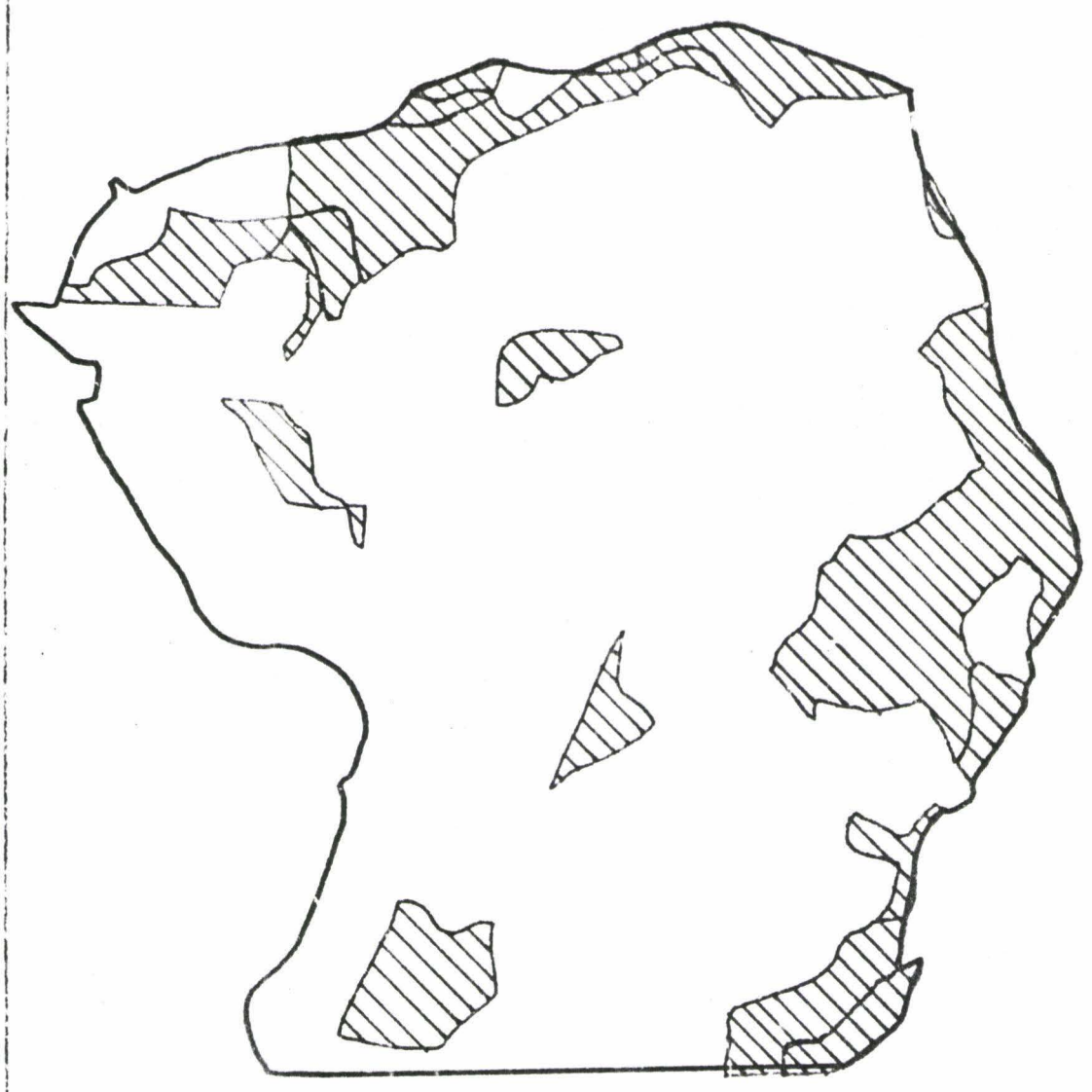
Enter the range of the Year of Origin and the Subdrainage to Find Acres Involved

Enter Year of Origin, from: 1866 to: 1931 Enter Subdrainage: 119F

MS

Cell	NF_Acres	Year_of_Origin	LUA
	Scenic I		
All Cells located in VAC L			
177	20	1870	SA
192	68	1870	SA
Total Acres in VAC L	88		
All Cells located in VAC M			
176	10	1870	SA
181	2	1870	SA
Total Acres in VAC M	12		
All Cells located in VAC H			
288	54	1870	SA
Total Acres in VAC H	54		
Total Acres in Scenic I	154		
	General Forest		
All Cells located in VAC L			
188	25	1870	TS
200	119	1870	TS
Total Acres in VAC L	144		
All Cells located in VAC M			
191	23	1870	TS
194	46	1870	TS
198	243	1870	TS
275	3	1870	TS
280	5	1870	TS
281	8	1870	TS
282	9	1870	TS
286	3	1870	TS
Total Acres in VAC M	340		
All Cells located in VAC H			
147	21	1870	TS
Total Acres in VAC H	21		
Total Acres in General Forest	505		
	LUA not in table		
All Cells located in VAC L			
178	23	1870	
Total Acres in VAC L	23		
All Cells located in VAC H			
148	16	1910	
Total Acres in VAC H	16		
Total Acres in LUA not in table	39		
Total Acres	698		

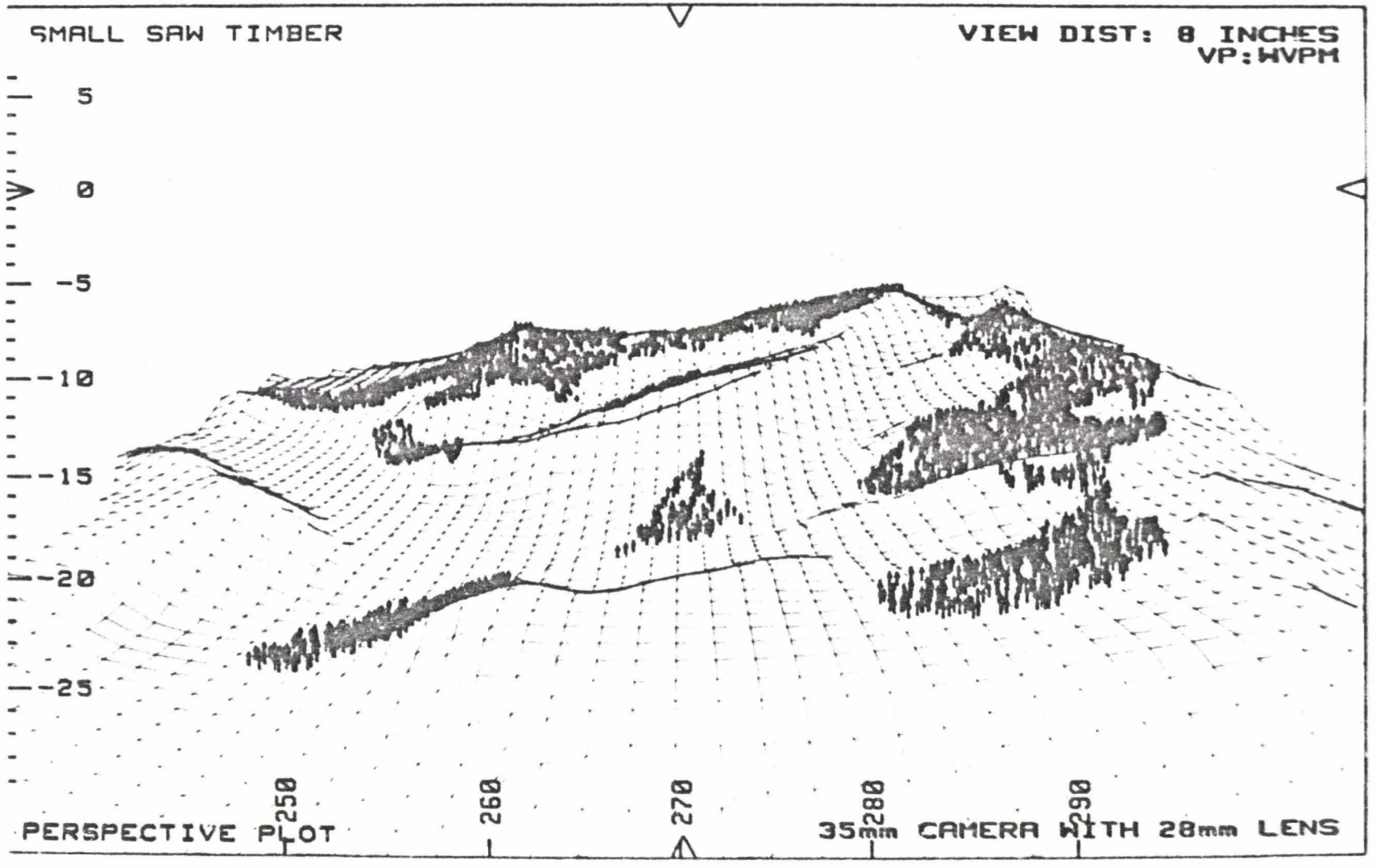
1/2



BUCKHEAD SUBDRAINAGE
119F

(MS) SMALL SAW

2/2


SMALL SAW TIMBER
VIEW DIST: 8 INCHES
VP:WVPM
5
0
-5
-10
-15
-20
-25
250
260
270
280
290
PERSPECTIVE PLOT
35mm CAMERA WITH 28mm LENS

Enter the range of the Year of Origin and the Subdrainage to Find Acres Involved

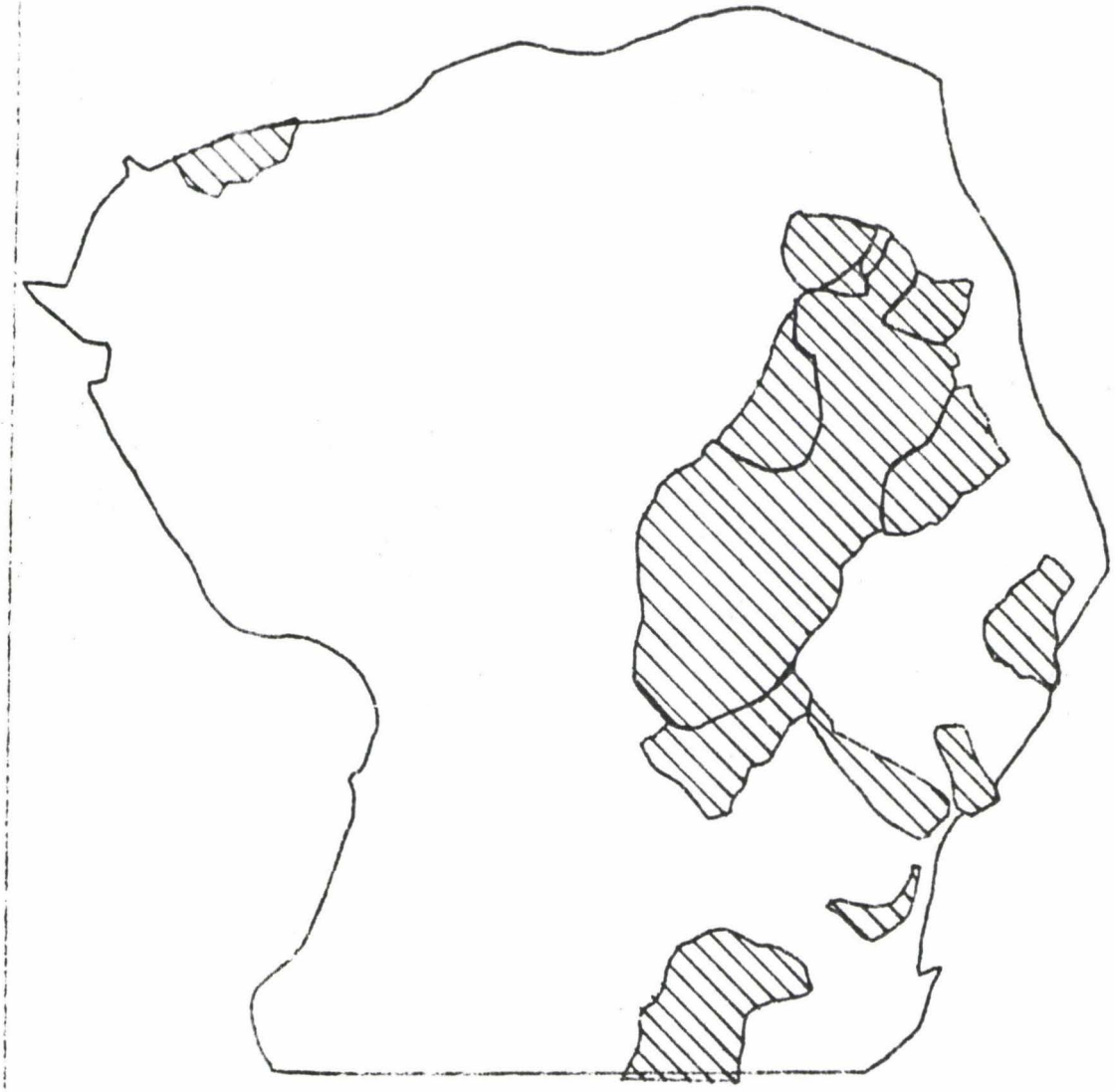
Enter Year of Origin, from: 1932 to: 1967 Enter Subdrainage: 119F

PL

Report of Acres for Subdrainage 119F for a range of Year of Origins

Cell	NF_Acres	Year_of_Origin	LUA
		General Forest	
All Cells located in VAC L			
140	19	1960	TS
142	300	1960	TS
203	40	1959	TS
Total Acres in VAC L	359		
All Cells located in VAC M			
132	46	1959	TS
137	22	1960	TS
138	3	1965	TS
143	42	1960	TS
144	28	1960	TS
145	25	1966	TS
146	14	1967	TS
202	4	1960	TS
Total Acres in VAC M	184		
All Cells located in VAC H			
130	74	1958	TS
151	53	1935	TS
219	15	1967	TS
285	25	1960	TS
295	29	1935	TS
Total Acres in VAC H	196		
Total Acres in General Forest	739		
Total Acres	739		

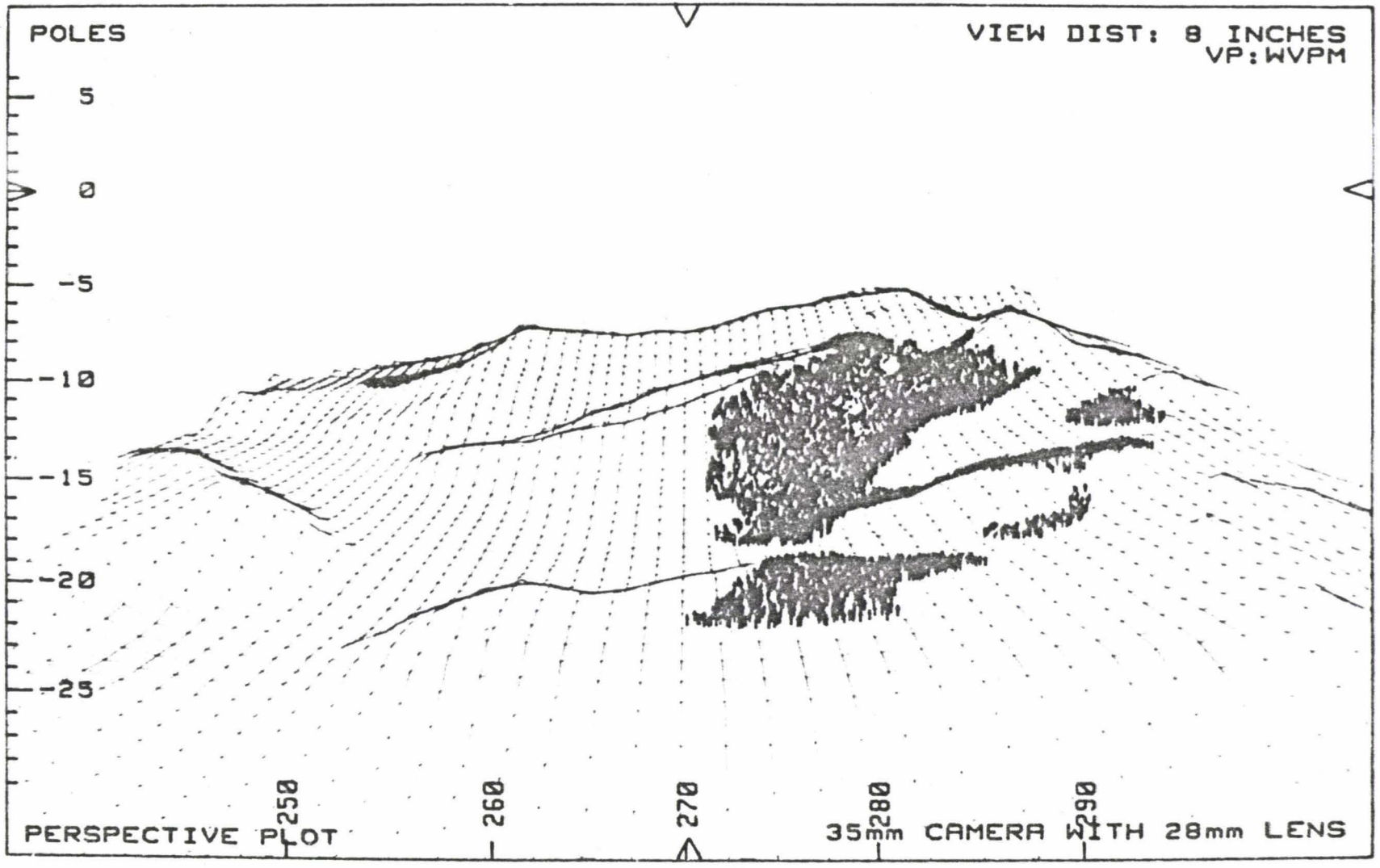
1/2



BUCKHEAD SUBDRAINAGE
119F

(PL) POLES

2/2


POLES
VIEW DIST: 8 INCHES
VP:WVPM
5
0
-5
-10
-15
-20
-25
250
260
270
280
290
PERSPECTIVE PLOT
35mm CAMERA WITH 28mm LENS

Enter the range of the Year of Origin and the Subdrainage to Find Acres Involved

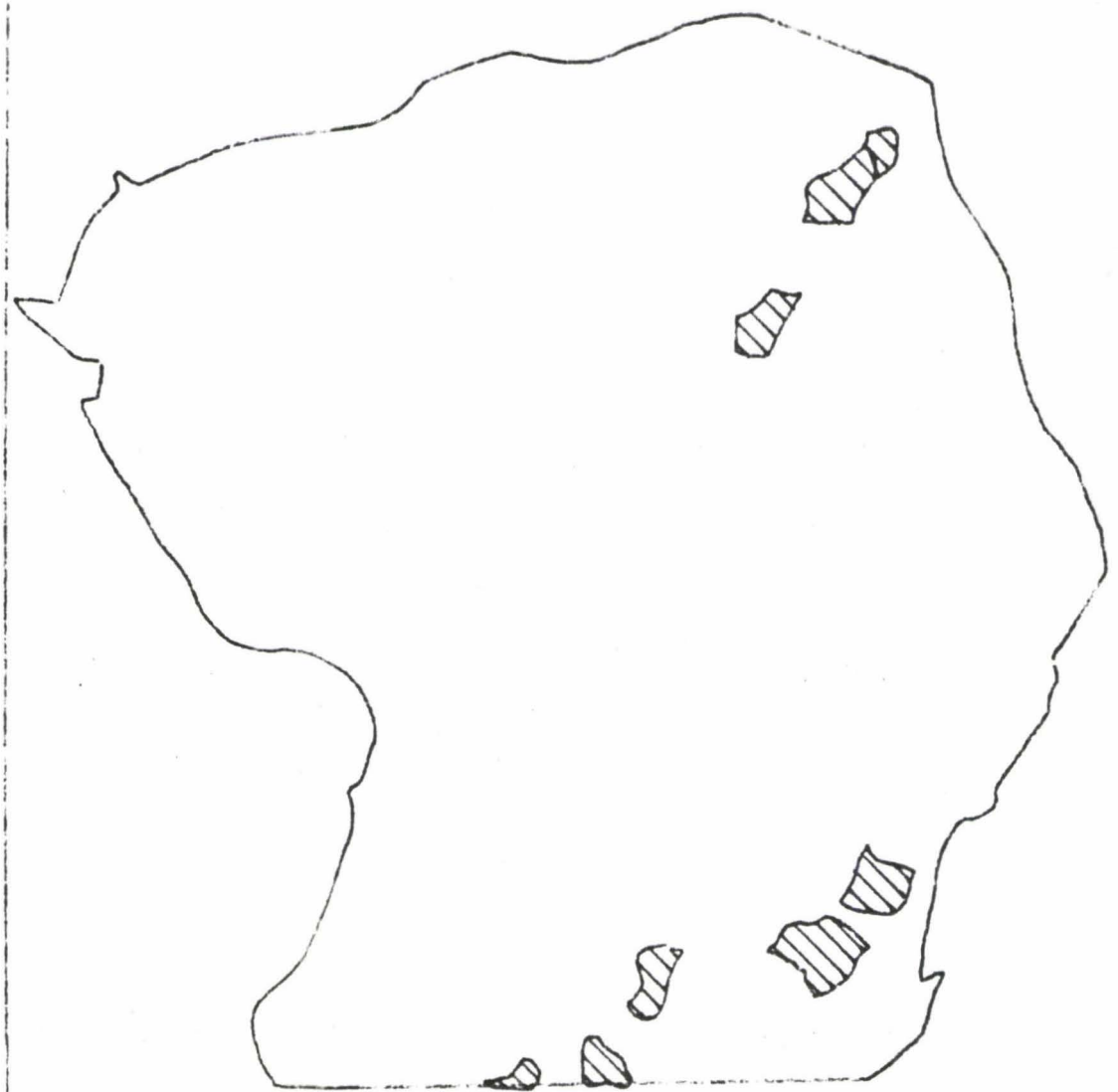
Enter Year of Origin, from: 1968 to: 1983 Enter Subdrainage: 119F

SS

Report of Acres for Subdrainage 119F for a range of Year of Origins

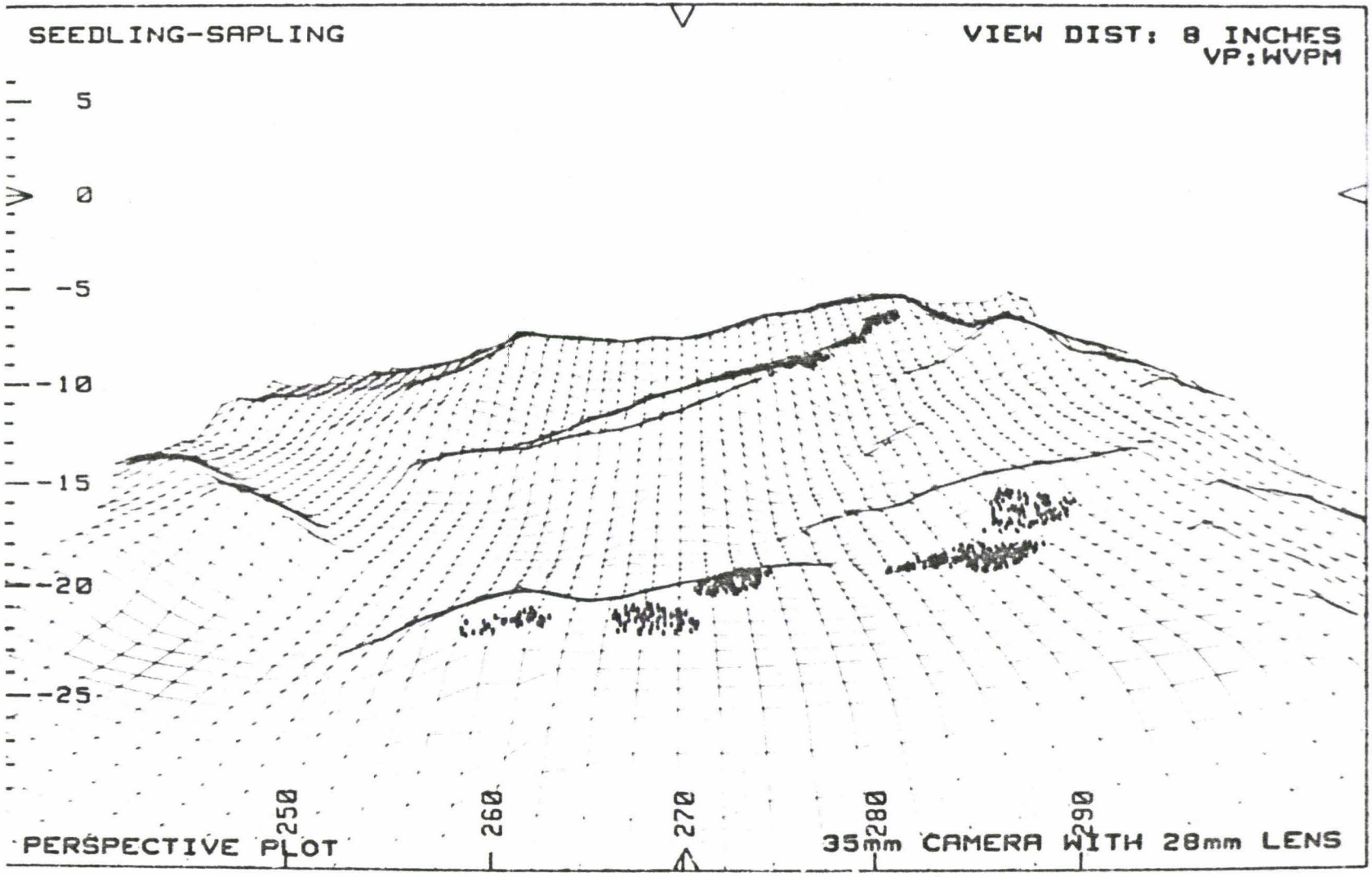
Cell	NF_Acres	Year_of_Origin	LUA	
		Scenic I		
All Cells located in VAC L				
127	4	1977	SA	
Total Acres in VAC L				4
Total Acres in Scenic I				4
		General Forest		
All Cells located in VAC L				
201	6	1978	TS	
293	23	1983	TS	
294	22	1983	TS	
Total Acres in VAC L				51
All Cells located in VAC M				
136	14	1978	TS	
141	10	1977	TS	
149	11	1970	TS	
Total Acres in VAC M				35
All Cells located in VAC H				
128	7	1978	TS	
129	10	1980	TS	
150	20	1974	TS	
Total Acres in VAC H				37
Total Acres in General Forest				123
Total Acres				127

1/2



BUCKHEAD SUBDRAINAGE
119F
(SS) SEED SAPLINGS

212


SEEDLING-SAPLING
VIEW DIST: 8 INCHES
VP:WVPM
5
0
-5
-10
-15
-20
-25
250
260
270
280
290
PERSPECTIVE PLOT
35mm CAMERA WITH 28mm LENS

Enter the range of the Year of Origin and the Subdrainage to Find Acres Involved

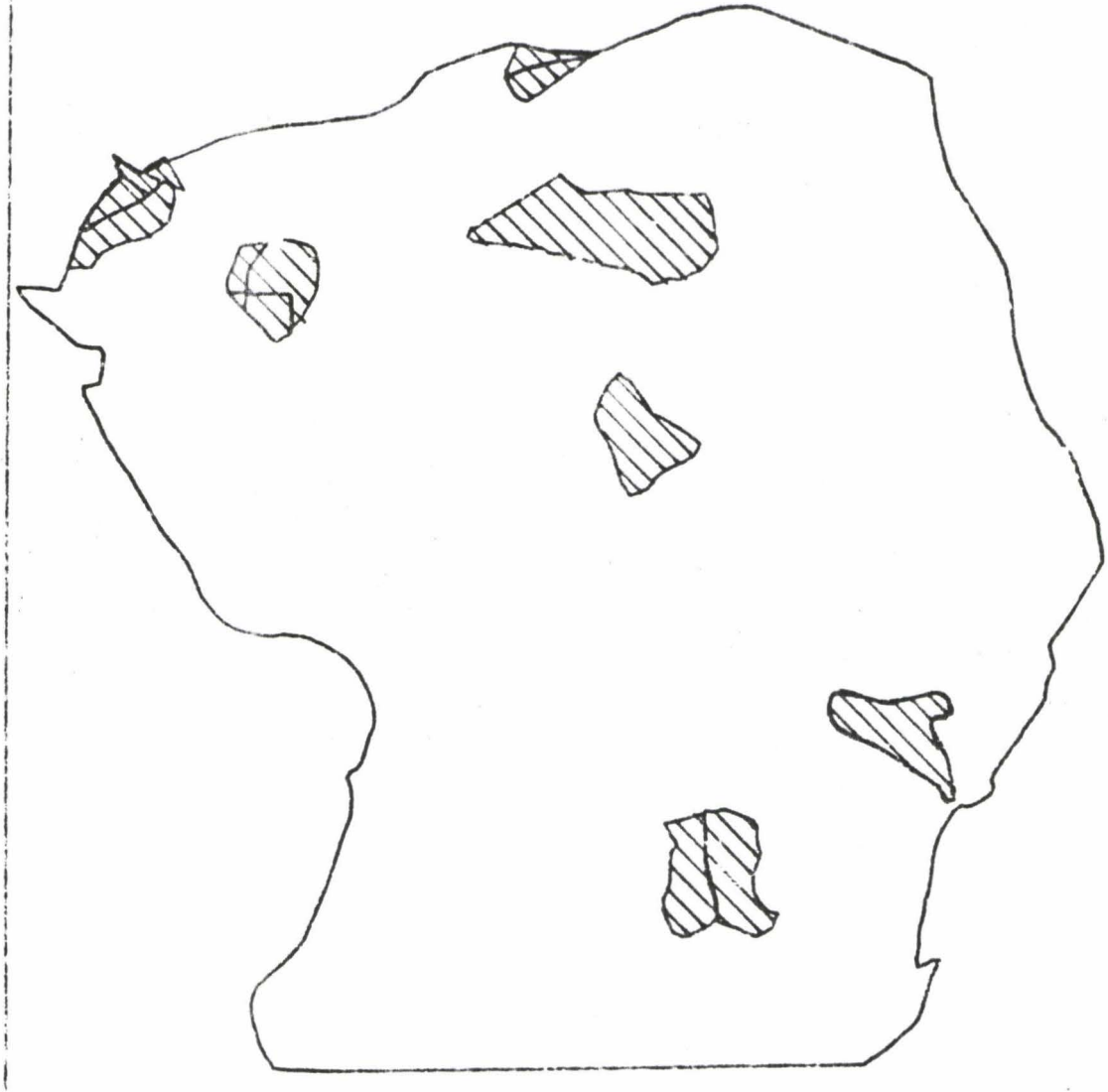
Enter Year of Origin, from: 1984 to: 1992 Enter Subdrainage: 119F

END

Report of Acres for Subdrainage 119F for a range of Year of Origins

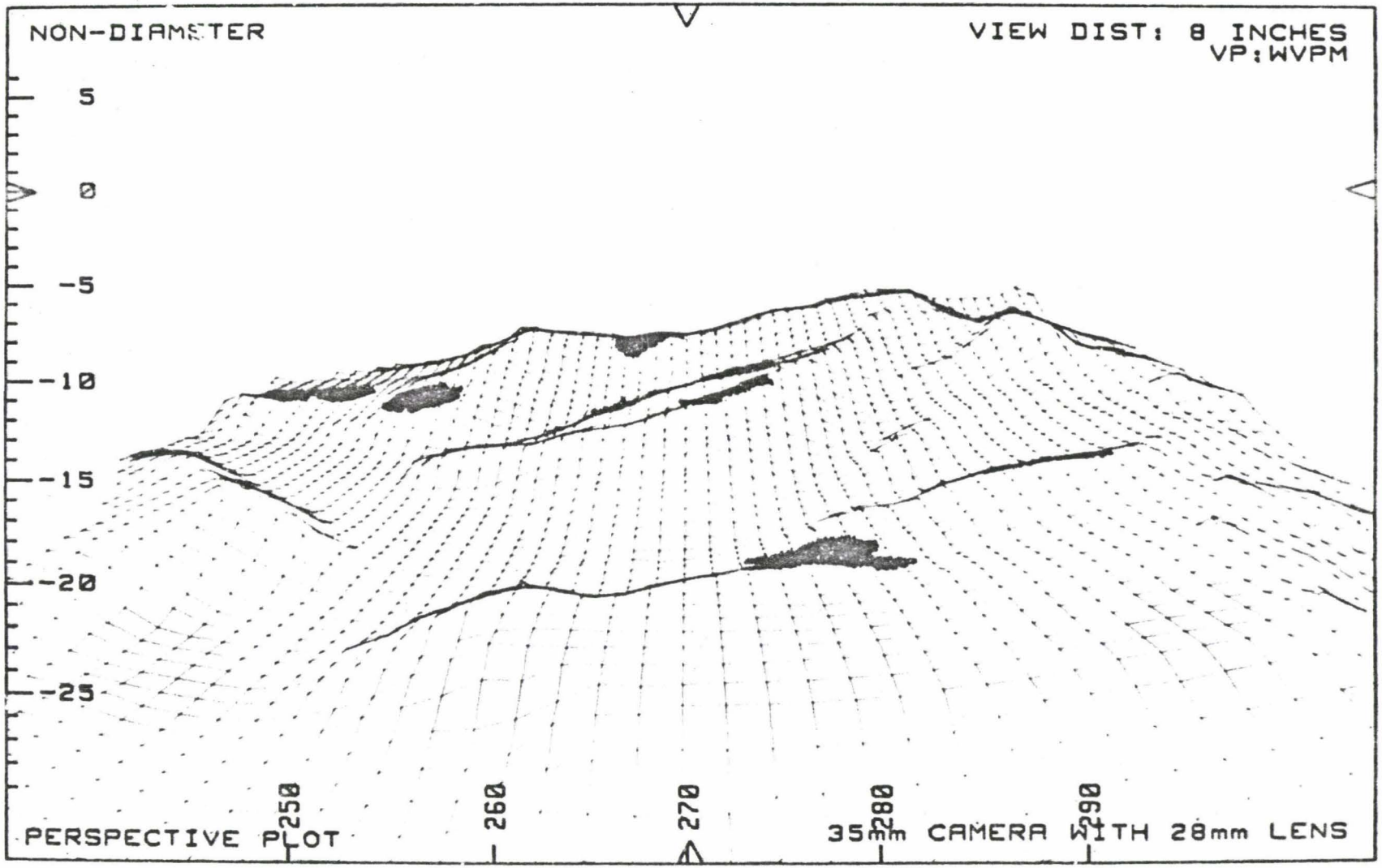
Cell	NF_Acres	Year_of_Origin	LUA
		Scenic I	
All Cells located in VAC M			
231	16	1988	SA
233	16	1988	SA
234	4	1988	SA
235	7	1988	SA
236	1	1988	SA
Total Acres in VAC M	44		
All Cells located in VAC H			
232	3	1988	SA
287	6	1988	SA
Total Acres in VAC H	9		
Total Acres in Scenic I		53	
		General Forest	
All Cells located in VAC L			
305	31	1988	TS
Total Acres in VAC L	31		
All Cells located in VAC M			
209	28	1988	TS
243	6	1988	TS
244	5	1988	TS
303	69	1988	TS
304	29	1988	TS
Total Acres in VAC M	137		
Total Acres in General Forest		168	
Total Acres	221		

1/2



BUCKHEAD SUBDRAINAGE
119F
(ND) NON DIAMETER

2/2


NON-DIAMETER
VIEW DIST: 8 INCHES
VP:WVPM
5
0
-5
-10
-15
-20
-25
250
260
270
280
290
PERSPECTIVE PLOT
35mm CAMERA WITH 28mm LENS

FUTURE NEEDS

FUTURE NEEDS

Ideas stimulate ideas. It is intended that the readers and users of this planning process will be stimulated to innovate this and other planning processes, making them more efficient.

The method of collecting, storing, retrieving, analyzing, and displaying spatial information can be accomplished with one integrated computer program. The application of a Geographic Information System (GIS) to this project could tie together most of the processes listed above, greatly increasing efficiency and accuracy plus providing some additional analysis tools. A GIS typically contains many layers of resource information including topography. It also provides the capability of analyzing the coincidence of resources in and between graphic locations. Using a GIS complex spatial model, projects such as this "Computer Aided Planning Process" can be more easily constructed.

The grid mapping system, "Plot 7", which is presently being used by the Forest Land Management Team is an example of a simple GIS applied to the Land Management Planning process. This small-scale, low resolution grid-cell-based mapping system is a good tool for capturing and displaying resource information about a large land area. It is inadequate for project level needs. In the future a Forest-wide resource data base for building a Forest plan will be extracted directly from the detailed, large-scale data layers in a GIS which can also be used in project activities.

Several minicomputer based Geographic Information Systems have been developed in both the public and private sectors. These systems incorporate extensive analytic tools for resource modeling and have the capability of storing large amounts of data. Work is currently being done to improve the accuracy of the automated interpretation of one of these systems called satellite imagery. The Okanogan and Wenatchee National Forests have used the ERDAS High Elevation Satellite Image Analysis System to identify fuel types and build a fire response model. Microcomputer based GIS's are being developed and will provide a less expensive means for analyzing smaller land areas. The potential also exists for linking the micro systems to larger minis for data storage and some computationally intensive analysis.

For those involved in Visual Resources, an area of future interest may be in optical, or laser disks. These record-like medium, store many thousands of images such as photos, maps, video frames and text that are indexed and instantly retrievable by a computer program. Images of particular portions of the Forest could be retrieved and viewed in conjunction with a GIS generated and manipulated view of the same area.

C O N C L U S I O N

CONCLUSION

By utilizing modern technology, a slow, cumbersome process can become a quick, highly flexible process in which information can be accessed, reformatted and used in several ways to benefit planning management activities such as timber sales in highly scenic and sensitive viewsheds on the Willamette National Forest.

The process described herein fully automates the quantitative part of viewshed corridor planning. The only form needed in this automated process is the matrix shown on the following page.

The process identified in this project can be considered as the "current State of the Art". Hopefully, a GIS can become a reality and provide the most sophisticated and accurate information which can be used to plan management activities as well as accurate Land Management Planning. We are on the doorstep of the future, I encourage you to open the door of the future and enter the world of tomorrow. Be creative and innovative.

A P P E N D I X

APPENDIX "A"

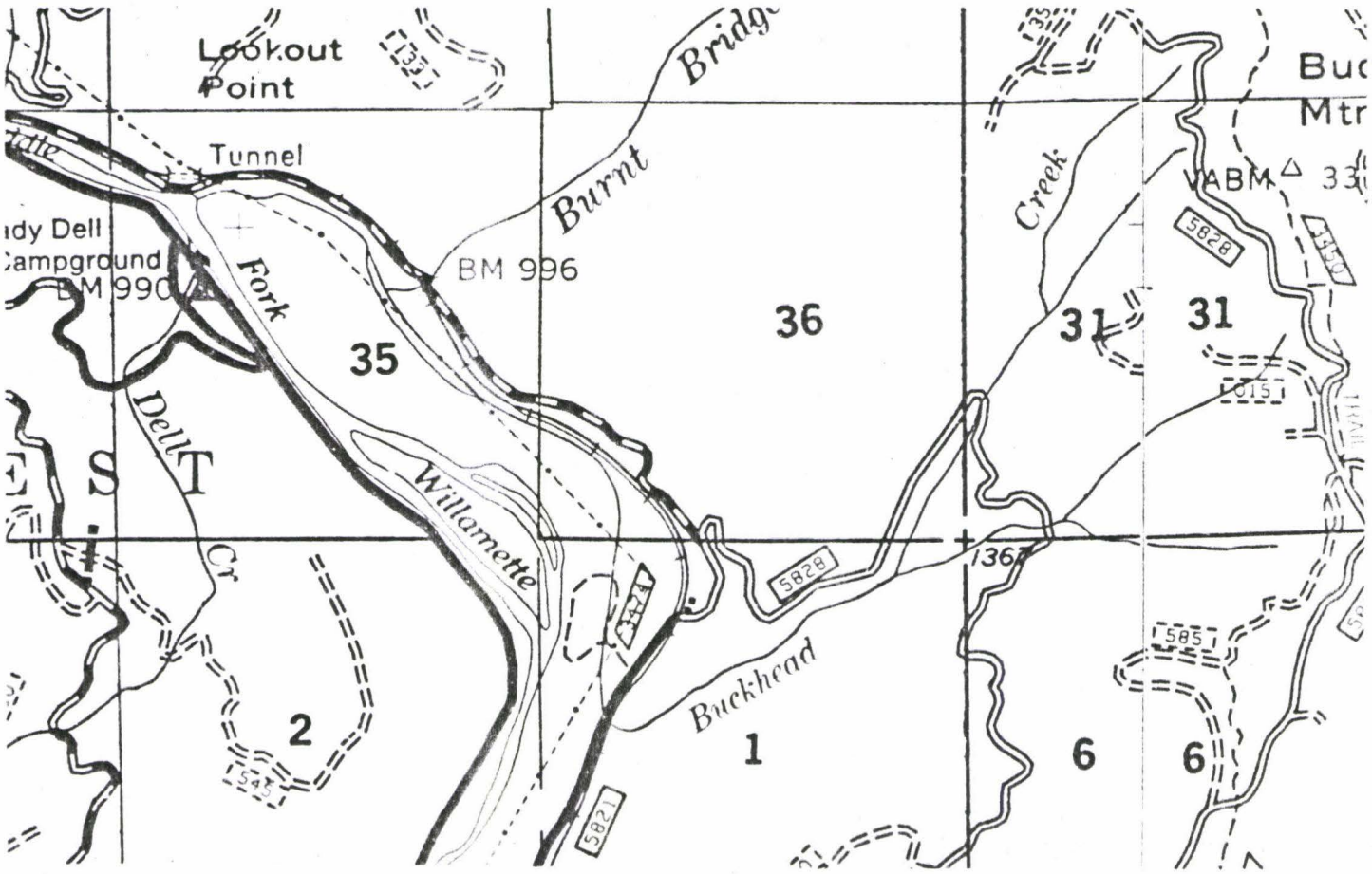
MANUAL (Hand cranked) QUANTITATIVE VIEWSHED PROCESS

The quantative viewshed planning process used on the Willamette prior to developing the "Computer Aided Viewshed Corridor Planning Process" is depicted below. Each step has been accomplished manually except for retrieving information from Ft Collins.

0

B A S E M A P

The selection of a base map which displays the area adequately without being cumbersom is important. The computer generated viewshed boundary can be easily matched, as can other information which exists at the same scale. We suggest the use of 1:24,000 USGS maps which contain coordinates. These maps are now available throughout Region 6.



T R I S Y S T E M

Printouts show tree size, land use allocation, subdrainage, and should include acreages and year of origin.

CELL INFO FOR VIEWSHED BY COMPT-CELL 1
01/24/1985

COMP NR	CELL & GRID	CELL ACRES	YEAR OF ORIGIN	SLOPE	EXPOS	ELEV	SOIL CLS	LND W	ECO-CLASS	SIDX	SP	TR CL	MJR SPP	TR SZ	D B H	TR STK	TPA	BA PER AC	MBF PER AC	MDIR CODE	PRACT CODE	PRACT YEAR	OPACT CODE	CPACT CODE	CPACT YEAR
6005	B1C4	2	—	80	S	1200	3	330 X	CH											VCN					
																				TMG					
																				PAS					
	B2C4	14	—	30	SW	1200	23	432 T	CHS1			M	DF	LS						VCN					
																				PAS					
	B3C4	36	—	50	SW	1400	23	330 T	CH											VCN					
																				TMG					
																				PAS					
	B4C4	4		0	F	1000	15	P	AB											PAS					
	B5C4	11		10	SW	1100	15	330 T	CH											VCN					
																				ZWL					
																				PAS					
	B6C4	2		0	F	1100	15	231 X	CHS1											VCN					
																				UPR					
																				ZWL					
																				PAS					
	B7C4	4		0	F	1100	15	231 T	CHS1											VCN					
																				UPR					
	to B8																			ZWL					
																				PAS					
	B9C4	8		0	F	1100	15	231 X	CHS1											VCN					
																				UPR					
																				ZWL					
																				PAS					
	90C4	15		10	SW	1100	15	330 X	CH											VCN					
																				ZWL					
																				PAS					
	91C4	8	—	50	SW	1200	21	432 X	CDS3			M	DF	LS						PAS					
	92C4	54		0	F	1100	15	330 X	CHS1											VCN					
																				ZWL					
																				PAS					
	96C4	3		0	F	1000	15	330 T	CHS1											VCN					
																				ZWL					
																				PAS					
	97C4	56		0	F	1100	15	432 T	CHS1			I	DF	MS						VCN					

VIEWSHED CORRIDOR TALLY SHEET

Transfer information from the TRI printout to the tally sheet. This information can be tracked back and forth and eventually updated when needed.

commercial
1 of

Excl non-comm

VIEWSHED CORRIDOR TALLY SHEET - Set1

DATE: JANUARY 18, 1985
REVISED:

DATA SOURCE:
COMPUTER ☐
MICROFICHE ☒
DISTRICT ☐

WATERSHED UNIT NO. 119F

COMPARTMENT NO. 6005 (ALL)

1985

	ACREAGE CATAGORIES				STAND STATUS IN ACRES (PERCENT)					CONDITION
CELL NUMBER	NATIONAL FOREST ACRES	YEAR OF ORIGIN	LAND USE ALLOCATION	V.A.C.	NS NON-STOCKED 0 - 4 DIA	SS SEEDLINGS SAPLINGS 5 - 4.9 DIA	PL POLE TIMBER 5 - 8.9 DIA	MS SMALL SAW TIMBER 9 - 20.9 DIA	LS LARGE SAW TIMBER 21+ DIA	DESCRIBE STAND STATUS RELATIONSHIP
										ACREAGE
81C4	2	1835	SeI	L					2	
82C4	14	1835	SeI	H					14	
83C4	36	1835	SeI	H					36	
91C4	8	1835	SeI	M					8	
99C4	15	1835	SeI	M					15	

The information is then transferrred to the "Pre-Matrix Tally Sheet" as shown below:

PRE-MATRIX TALLY SHEET

ACRES

		SUB TOTAL	TOTAL
SCI			
	ND		-
	SS		-
	PL		-
	MS		-
	LS		-
TOTAL			
NCII			
	ND		
	SS		
	PL		
	MS		
	LS		
TOTAL			
REG			
	ND		
	SS		
	PL		
	MS		
	LS		
TOTAL			
PRIVATE			
OTHER			
GRAND TOTAL ACRES			

The pre-matrix tally sheet organizes the information on the tally sheet by summing like acreages.

MATRIX

The matrix displays the basic subdrainage data in a useable form. The conclusion of whether the subdrainage is "under treated", "at optimum treatment level", or "over treated" can be arrived at upon review of this matrix.

WILLAMETTE VIEWSHED CORRIDOR

DESIGN UNIT DISPLAY

UNDERTREATED ☐
OPTIMAL ☐
OVERTREATED ☐

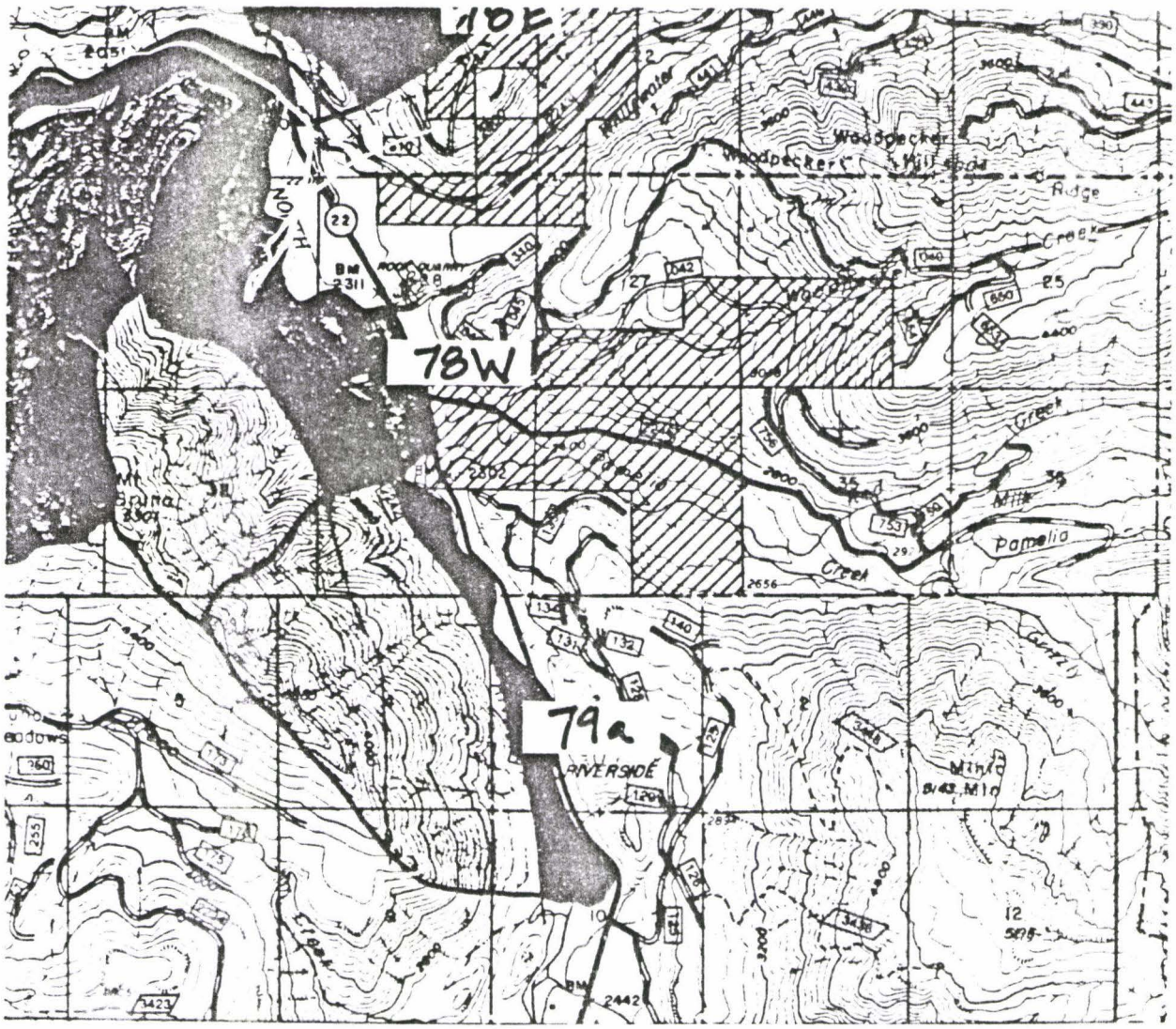
UNIT NO. 119F
VEG. TYPE DF

LAND ALLOCATION	ACREAGE CATAGORIES				STAND STATUS IN PERCENT AND ACRES OF CFL AREA					CONDITION
	GROSS AREA	UNPRODUCTIVE FOREST	CFL	DECADE TREATMENT TARGET	NS NON-STOCKED 0 - .4 DIA	SS SEEDLINGS SAPLINGS .5 - 4.9 DIA	PL POLE TIMBER 5 - 8.9 DIA	MS SMALL SAW TIMBER 9 - 20.9 DIA	LS LARGE SAW TIMBER 21+ DIA	DESCRIBE STAND STATUS RELATIONSHIP
SCENIC INFLUENCE I R=150	715 L1	22	693	.18 39	73ac	0	0	25	595	ACREAGE
					10 [illegible]	0	0	4%	86%	PERCENT
					0 - 5.5	5.5 - 11	5.5 - 11	16.5 - 22	60.5	OPTIMAL %
SCENIC INFLUENCE II										ACREAGE
										PERCENT
					0 - 8.3	8.3 - 16.6	8.3 - 16.6	24.9 - 33.2	41.5	OPTIMAL %
DISPERSED MOTOR/NON REC-TIMBER										ACREAGE
										PERCENT
					0 - 7.1	7.1 - 14.2	7.1 - 14.2	21.3 - 28.4	49.7	OPTIMAL %
GENERAL FOREST R=80	2246 L2	69 L6	2177	272	200ac	108ac	586	289	994	ACREAGE
					9%	5%	27%	13%	46%	PERCENT
					0 - 10	10 - 20	10 - 20	30 - 40	80	OPTIMAL %
OTHER UNREGULATED & PRIVATE	144 / 28 L3	Set 2 [illegible] unproductive show above. Buckhead Wildlife Area includes Powerline, Water Admin acs. Buyback sales in as 1986 NS. [illegible] Oregon Est by photos + use known stand acs on Buckhead Mtn								
TOTALS	3385 L5	91	2870	[illegible]	273	108	586	289	994	EXISTING ACREAGE

L1 Comm'l tally Set 1
L2 comm'l tally + unproductive lands (Set 1 + 2)
L3 Set 3. Buckhead acres dropped call 88C4
L4 Staghorn Cut Unit + Burnt Pt. Sale TD — Re estimate by photo spl [illegible]
L5 Includes 24acs 117A (Oakridge) call 15C5 + 26BD5

The status or treatment level of the subdrainage can now be mapped.

MAP OF VIEWSHED STATUS



UNDER TREATED

OPTIMAL TREATMENT

OVER TREATED

DISPLAY DATA ON PRE-MATRIX

Display VAC, tree size, and land use allocation on the VAC pre-matrix tally sheet.

PRE-MATRIX TALLY SHEET comp# Watershed#

VAC		LOW	MED.	HIGH	SUBTOTAL	
SCI	ND	16,4		14,7,6,4		AC CFL
	SS					
	PS					
	MS	2	23			663
	LS	230,62,6,21,80,10,62,68,8,512	8,15,40,23	34,14,54,18,54		
	NONPROD. FOR.					
	SUBTOTAL	358	99	206		
SCII	ND					AC CFL
	SS					
	PS					
	MS					
	LS					
	NONPROD. FOR.					
	SUBTOTAL					
REG	ND	69291	10,28	6,5,2322		AC CFL
	SS	25	14,3,10,14,11,6,4	7,1025		
	PS					
	MS	19,200,42,40	22,28	74,46,15		2170
	LS	25,96,119	21,16	53,9		
	NONPROD. FOR.	29,155,11,44,27,23,[illegible],1335	15,76,7,3	89,27,13,583		
	SUBTOTAL					
		1370	357	448		
PRIVATE AND OTHER UNREGULATED						
TOTAL		1728	451	654	2833	GRAND TOTAL

M A T R I X

Place above information on a new matrix having spaces provided to display acres of tree sizes within each VAC rating.

UNDERTREATED ☐
OPTIMAL ☒
OVERTREATED ☐

UNIT NO. 119F
VEG. TYPE DF

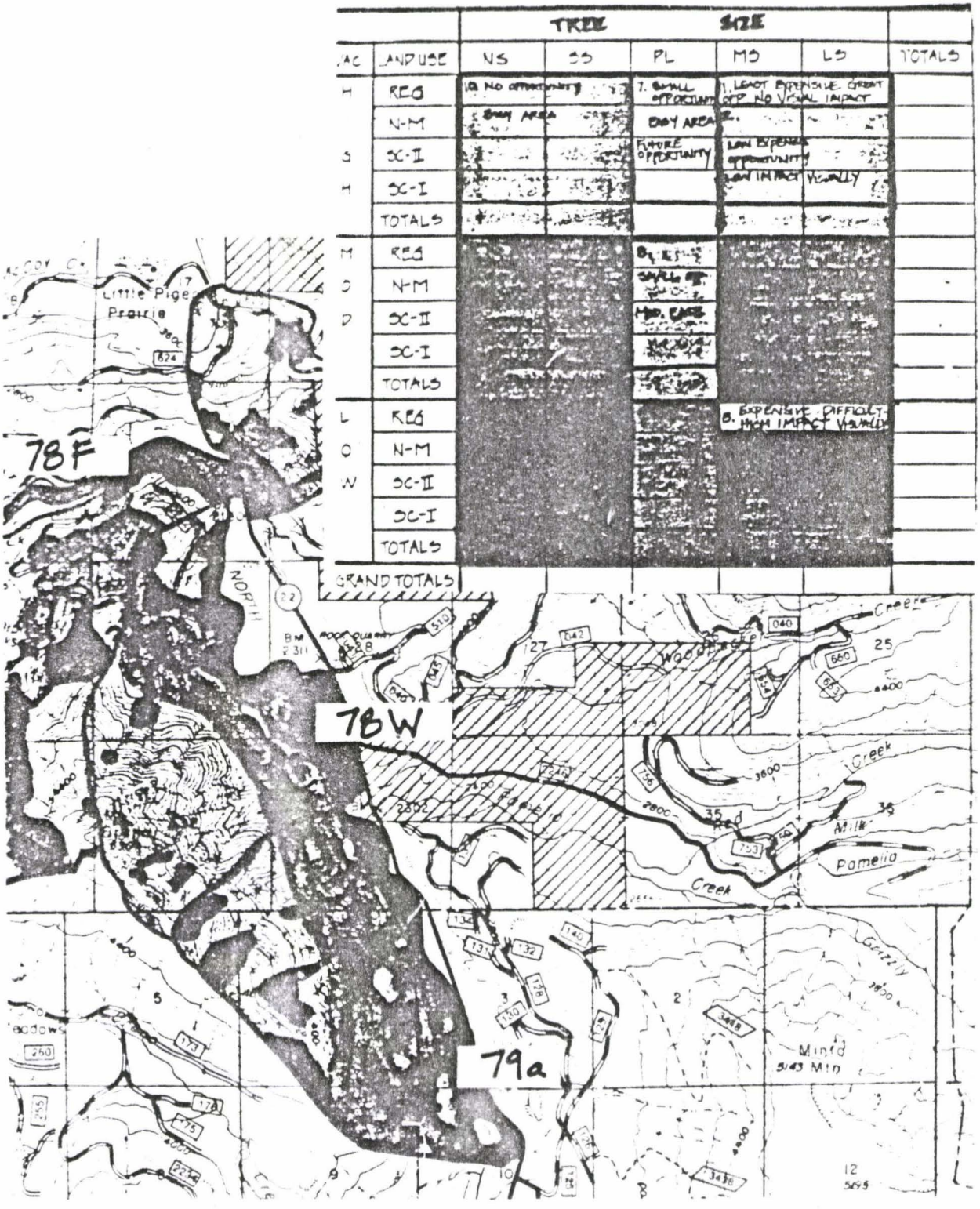
VIEWSHED CORRIDOR

DESIGN UNIT DISPLAY

LAND ALLOCATION / VAC	ACREAGE CATAGORIES: GROSS AREA	UNPRODUCTIVE FOREST	CFL	DECADE TREATMENT TARGET	STAND STATUS IN PERCENT AND ACRES OF CFL AREA: NS (H M L) NON-STOCKED .0 - .4 DIA	SS (H M L) SEEDLINGS SAPLINGS .5 - 4.9 DIA	PL (H M L) POLE TIMBER 5 - 8.9 DIA	MS (H M L) SMALL SAW TIMBER 9 - 20.9 DIA	LS (H M L) LARGE SAW TIMBER 21+ DIA	CONDITION: DESCRIBE STAND STATUS RELATIONSHIP
SCENIC INFLUENCE I	805	168	667	37	30 / 20	4		23 / 2	176 / 76 / 336	ACREAGE
					50	4		25	588	
					7%	1%		4%	82%	PERCENT
					0 - 5.5	5.5 - 11	5.5 - 11	16.5 - 22	60.5	OPTIMAL %
SCENIC INFLUENCE II	0									ACREAGE
										PERCENT
					0 - 8.3	8.3 - 16.6	8.3 - 16.6	24.9 - 33.2	41.5	OPTIMAL %
DISPERSED MOTOR/NON REC-TIMBER	0									ACREAGE
										PERCENT
					0 - 7.1	7.1 - 14.2	7.1 - 14.2	21.3 - 28.4	49.7	OPTIMAL %
GENERAL FOREST	2269	99	2170	217	56 / 38 / 99	52 / 62 / 25	157 / 28 / 401	62 / 37 / 190	143 / 165 / 655	ACREAGE
					193	139	586	289	963	
					9	7	27	13	44	PERCENT
					0 - 10	10 - 20	10 - 20	30 - 40	80	OPTIMAL %
OTHER UNREGULATED & PRIVATE	309									
TOTALS	3383	237	2837	254	243	143	586	314	1551	EXISTING ACREAGE

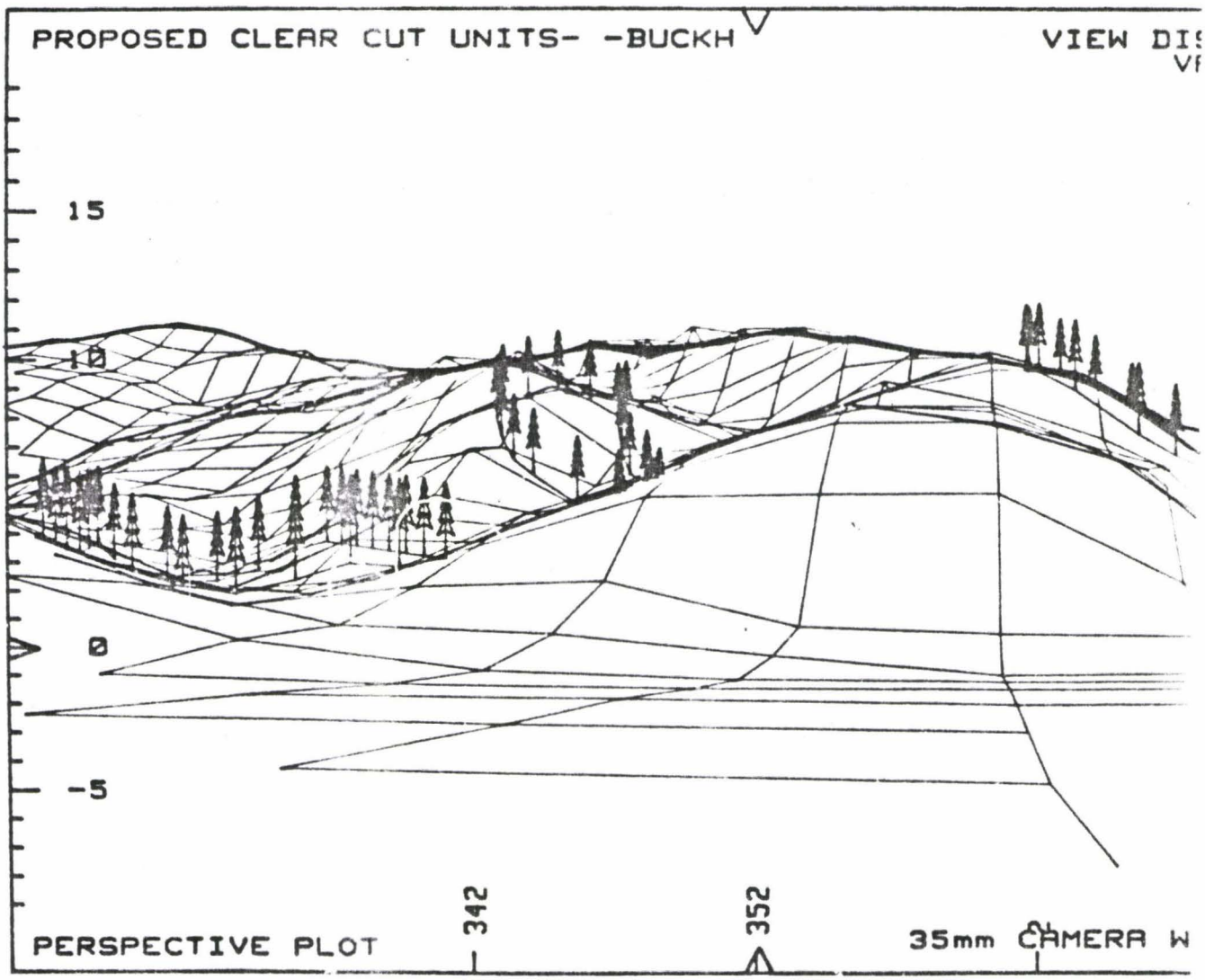
TREE SIZE/ VAC/LUA MAP

This map displays the information from matrix above.



PERSPECTIVES OF HARVEST ALTERNATIVES

Perspective plots using the Hewlett Packard computer depict the appearance of the proposed management activity.



B I B L I O G R A P H Y

1986 "Version 4.8 - 3-06-86.

Erl Swanson, USDA Forest Service, "STEAMBOAT CREEK ROAD CORRIDOR PLAN", Umpqua
1979 National Forest, Roseburg, Oregon, 1979.

USDA Forest Service, "NATIONAL FOREST LANDSCAPE MANAGEMENT", Vol. 1, Chapter 1,
1973 Agriculture Handbook Number 434.

USDA Forest Service "NATIONAL FOREST LANDSCAPE MANAGEMENT", Vol. 2, Chapter 1,
1974 Agriculture Handbook Number 462.

USDA Forest Service, "NATIONAL FOREST LANDSCAPE MANAGEMENT", Vol. 2, chapter 5,
1980 Agriculture Handbook Number 559, pp 44-48, and pp 148-171.

Willamette National Forest, USDA Forest Service, "SOIL RESOURCE INVENTORY
1973 ATLAS OF MAPS AND INTERPRETIVE TABLES", 1973.

Willamette National Forest, USDA Forest Service, "MULTIPLE USE LAND MANAGEMENT,
1977 TIMBER MANAGEMENT PLAN, FINAL ENVIRONMENTAL STATEMENT", Part I,

Willamette National Forest, USDA Forest Service, "5/81 PLANNING SUPPLEMENT",
1981 FSM 1931.